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BRITISH SHIP BUILDING DURING 1907.

The New Year number of the *Shipping World*, London, is brimful of interesting and very readable information regarding the ship building industry of the United Kingdom. The ship building year of 1907, this journal says, has surprised the prophets and produced results which—in Stevensonian phrase—have met with "the astonished consideration of men and angels." It has not been a year of big ships like its predecessor. The Lusitania, the Mauretania, the Adriatic and the Dreadnought belong to 1906, although 1907 reaps the benefit. Neither has it been a record year in total output. That distinction also belongs to 1906, and 1907 must be content to take second place. And yet it has its own records, its own features, its exclusive characteristics. Never before has the Clyde produced so large a tonnage, nor so many units. Seldom if ever has the Tyne launched so important a number and type of warships as in the 12 months just ended. Again, as in 1905, the Wear carries off the blue riband of these ship building islands. The Tees has been remarkable for the production of record cantilever-framed topside tank steamers, and the introduction of a new system of ship building. The Hartlepools have turned out some noteworthy craft for foreign owners. The Isle of Wight and Southampton have given the fastest warships afloat, and Birkenhead a vessel which has been built to eclipse everything in speed. Ireland, too, has not been behind. From Belfast has come the largest ocean-going oil-carrying barge in the world, and the largest passenger steamer for the South American trade. In many respects, therefore, 1907 has proved itself to be a memorable year, and not the least surprising feature of it has been the unexpected output.

To understand how all this has come about, we have to go back to the autumn of 1905. At that period things generally were believed to have touched bottom. Labor in the ship yards was relatively cheap, while the prices of ship building materials, both raw and finished, had seldom been so low. The hour, from the ship owner's point of view, was never so propitious, and as a direct consequence we witnessed the sudden development in the placing of orders for new tonnage which distinguished September and October of 1905, and which was repeated with somewhat more caution in the early weeks of 1906. The result we already know in the record ship building output of the last-named year. But even the enormous totals reached during 1906 did not clear off all the orders on the books of the builders, and as a result 1907 benefited from the "boom" of 1905 and 1906. Indeed, although the slackness now so keenly felt has been long predicted and anticipated, it was averted until about three or four months ago; and it is almost certain that its full effect has not yet been experienced. So that, notwithstanding the depression of the last quarter, the year generally has achieved wonderfully good results; and though it owes its success in large measure to the full-pressure activities of 1906, it is none the less real on that account. It has falsified pessimistic reports and confounded the prophets of evil, and while it remains true that the depression appears likely to be accentuated in the current year, the figures for 1907 indicate a prosperity which one does not usually associate with a lean year.

Many causes operating together have contributed to the existing depression. They are well known to most observers of our industrial activities, but they may be profitably recalled here. Briefly they are these: (a) The existing glut of tonnage following upon the record output from our ship yards during the past two years; (b) the continued lowness of freights, partly, if not wholly, to be accounted for by the excess in available tonnage; (c) the new load lines, which have added so materially to the carrying capacity of vessels now afloat; (d) the high bank rate—7 per cent since Nov. 7 last—and dearness of money; (e) the dearness of labor and material in ship construction; (f) dear bunker coal, high-working costs for the ship owner on board his ship at sea and in harbor, and port detention; and (g) competition from the large liners in general cargo carrying. All these militate against the placing of new orders, and although some of the causes named are temporary in effect, others are likely to remain and will have to be accepted in the future. It is satisfactory to note, for example, that the long-continued dearness in ship material shows signs of weakening. Steel ship plates for over three-quarters of the year ruled £7 10s per ton, and only in November last were they reduced to £7. Even at this figure the price is too high in the existing circumstances, and indications are not wanting that in a few weeks they will be sold generally at £6 10s per ton, and very probably at a lower figure still. Wages, too, are about to be reduced in practically all the ship yards of the country, and consequently two of the most important causes we have enumerated will be removed at no distant date. But improvement will have to be ef-

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fected in other directions before a satisfactory recovery of the ship building industry can be looked for. In our ship building review of this date last year we pointed out that 1907 would suffer in comparison with 1906, because fewer contracts for new tonnage had at that date been placed; and if this has proved true of last year it will prove even more true of the current 12 months. Inquiries there are in the market, but few contracts and few orders.

The past year has again given to the northeast coast the blue riband of British ship building. In total quan tity of output the first half-dozen firms of the United Kingdom are as follows:

Name and Place of Firm.		No. of vessels.	B. of T. tons.
1—Wm. Doxford & Sons, Ltd., Sunderland	(2)	22	91,254
2—Harland & Wolff, Ltd., Belfast	(3)	9	75,015
3—Russell & Co., Port Glasgow	(6)	14	71,705
4—Swan, Hunter & Wigham Richardson, Ltd., Wallsend and Walker	(1)	19	69,064
5—Workman, Clark & Co., Ltd., Belfast	(5)	24	63,245
6—Sir W. G. Armstrong, Whitworth & Co., Ltd., Elswick and Walker	(—)	12	50,538
		100	420,821

(The figures in parentheses indicate the position of the firms in 1906.)

These six firms, then, have turned out 100 vesesls of 420,821. Board of trade tons, or with an average register tonnage of over 4,200 tons. This is not so large either in numbers or in tonnage as in 1906, when 112 vessels of 488,520 tons were produced by the first six ship building establishments in the kingdom, but the average size of the vessels is about the same. And, while it is true that we have no great Cunarder or White Star liner in last year's totals, some noteworthy vessels were turned out. The following is a list of 10 of the largest merchant ships of 1907:

Vessel—	B. of T. Tons.	Builders.
1 Asturias (R. M. S. P. Co.)	12,900	Harland & Wolff, Ltd.
2 Pericles (Aberdeen-Australian Line)	11,960	Harland & Wolff, Ltd.
3 Corsican (Allan Line)	11,637	Barclay, Curle & Co., Ltd.
4 Avon (R. M. S. P. Co.)	11,073	Harland & Wolff, Ltd.
5 Cairo (Egyptian Mail S. Co.)	10,897	Fairfield Co., Ltd.
6 Heliopolis (Egyptian Mail S. Co.)	10,897	Fairfield Co., Ltd.
7 Hesperian (Allan Line)	9,598	A. Stephen & Sons, Ltd.
8 Grampian (Allan Line)	9,597	A. Stephen & Sons, Ltd.
9 City of Paris (City Line)	9,292	Barclay, Curle & Co., Ltd.

Belfast and the Clyde share the honors of producing the largest units of the year.

The total output of the centers may be stated in tabular form as follows:

	——1907——		——1906——	
	No.	B. of T. Tons.	No.	B. of T. Tons.
The Clyde	538	581,579	372	575,433
The Forth	57	21,174	39	17,077
The Tay	40	15,891	27	28,635
The Dee	132	15,080	75	11,719
The Tyne	149	308,046	159	387,343
The Wear	91	294,552	99	326,060
The Hartlepools	29	94,327	44	140,303
The Tees	54	135,129	44	149,922
The Humber	118	31,280	134	34,262
The Thames	81	8,594	127	11,141
English East, West and South Coast Outports	240	28,027	317	43,041
Ireland	39	139,442	28	149,861
Royal Dockyards (displacement tonnage)	3	37,800	3	47,100
Totals	1,571	1,724,921	1,468	1,921,897
Decrease	.....	.....	.....	196,976

SOME PHASES OF THE FUEL QUESTION.*

BY PROF. VIVIAN B. LEWIS, F. I. C., F. C. S., ASSOCIATE MEMBER OF COUNCIL.

It is only a century since the naval architects had their ideas revolutionized by the introduction of steam, and the marine engine has gradually swept the sea of the sailing ship, while now in turn the supremacy of the steam-driven engine is threatened by the internal-combustion motor, and we seem to be on the eve of a period marked by the rivalry of the marine engine and turbine on the one hand, and the oil and gas engine on the other.

For high powers the victories of the latter have all been on land, and under conditions totally different to those which would have to be fulfilled afloat, but for small powers there is no gainsaying the unqualified success of the petrol motor boat, or that the labors of Capitaine and others have made the suction plant and gas engine a possibility, while Mr. Milton's able communication to the Institution of Civil Engineers in January last warned us that the oil engine using heavier grades of oil than petrol would soon be employed for marine propulsion.

All these varieties of the internal-combustion engine have their drawbacks. The petrol is an active danger afloat, owing to its volatility, the difficulty of preventing any escape, the small quantity of vapor that is needed to render an atmosphere explosive, and the way in which the vapor, owing to its weight, will flow along a surface for a considerable distance, and, on igniting, will carry flame back to the tanks, which, once alight, defy extinction.

The suction plant suffers from the limitation that, before it can achieve commercial success afloat, a form of generator and scrubber, occupying a small space, must be devised in which bituminous coal can be used as the fuel to be gasified, and the gas supplied freed from all tar vapor, and, although Mr. Thornycroft, in his admirable paper on the subject at the last spring meetings of the Institution, spoke hopefully of this being on the eve of fulfilment, I am not aware that it has yet been successfully done. The mechanical troubles of caking and arching of the fuel in the generator can be overcome, but many years' experience of efforts to decompose or get rid of tar vapor has impressed me with a great respect for the difficulties of the problem, and a perfectly clean gas, absolutely free from tar vapor, is the first essential for success with the gas engine. The heavy oil engine also has its troubles of feed, compression, and ignition, but these are of a kind much more likely to be easily overcome, and in some forms of engine have almost disappeared.

At the present moment I think we may fairly say that for high powers afloat the internal-combustion engine is purely in the experimental stage, and that, although by next spring the time may probably be ripe for a full discussion of the power and fuel question, it would be premature to do so now, and my desire is to bring forward a plea affecting only one small portion of this all-important subject.

In the service the petrol motor has been employed in the submarines, for use when cruising above water, and, although in future boats it may be replaced by other propellants, I cannot help the feeling that for several reasons it would be a very great advantage if, by simple alterations to the present engines, the ever-existing dangers inseparable from its use could be done away with, and a safer liquid used, and I think for this purpose alcohol offers advantages that should command attention, and lead to a thorough investigation as to the possibility of employing it. It must also be borne in mind that the performances of the motor boat are such as to make it certain that in any future

* Read at the meetings of the forty-eighth session of the Institution of Naval Architects.

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naval war they will probably play an important part in coast defense, and here again the advantages of alcohol over petrol would, I think, be very great.

In England alcohol has practically never been experimented with as a fuel for high-speed motors, although it has been successfully adapted to slow-running engines by Messrs. Tangyes, this being due to the fact that all the time petrol or petroleum spirit could be obtained at 1s or less per gallon, alcohol handicapped by state restrictions and duties could never come into competition with it, and for this reason only it has been experimentally neglected.

On the continent, however, the desire to foster industries which would keep labor on the land has in several countries led to the encouragement rather than the hampering of the production of alcohol for industrial uses, and in Germany and France the use of alcohol for motors was made a commercial success, and many hundred vehicles employing alcohol as a fuel were in constant use. The alcohol used in these was made from potatoes, and in 1902 and 1903 its price was about 8d to 9d per gallon, and in Germany, there being a tax on petrol, it was cheaper to use the potato spirit; the failure of the crop in 1904, however, caused a rise in price to 1s 1d per gallon, with the consequence that the economic advantages disappeared, and with them alcohol as a fuel.

In England petrol is free from any import tax, whilst alcohol is so hedged around with legislative precautions that the methylated, or some prefer to call it, "denatured," spirit allowed to be sold duty free for industrial purposes costs 2s per gallon, so that, although the price of petrol is rapidly rising, alcohol is unlikely to be employed generally in the place of petrol for a long time to come. These considerations, however, do not enter into the question I am now raising, as any extra safety we can give in the submarine is far more important than any question of cost, and it must be remembered that alcohol is a native product, while in the event of a long war we might find ourselves considerably hampered by the failure of the petrol supply, and it appears to me that, if the feasibility of using alcohol as effectively as petrol can be shown, nothing should stand in the way of its adoption.

In comparing the relative values of petroleum spirit and alcohol, the first point that must be taken into consideration is their thermal value, and in doing this with alcohol it is only the methylated spirit which need be considered.

Taking samples of Pratt's motor spirit, having a specific gravity of 0.722, as representing the petrol, determinations were made of its thermal value, with the following results:

	Calories.		British Thermal Units.	
	Gross.	Net.	Gross.	Net.
(*a*)	11,514.6	10,818.6	20,726.3	19,473.5
(*b*)	11,146.9	10,624.9	20,064.4	19,124.8
(*c*)	11,174.4	10,742.4	20,113.9	19,336.3
Aver..	11,278.6	10,728.6	20,301.5	19,311.5

In the same way samples of commercial methylated spirit gave:

	Calories.		British Thermal Units.	
	Gross.	Net.	Gross.	Net.
(*a*)	6,491.5	6,011.5	11,684.7	10,820.7
(*b*)	6,089.0	5,489.0	10,960.0	9,880.2
(*c*)	6,285.0	5,805.0	11,313.0	10,449.0
Aver..	6,288.5	5,768.5	11,319.2	11,383.3

It is evident, therefore, that, weight for weight, alcohol has not much more than half the califoric value of the petrol, whilst by volume the heat of combustion of the vapors would stand to each other as follows: Petrol, 50.8 calories per c. c. of vapor. Alcohol, 14.8 calories per c. c. of vapor.

So that, if thermal value were the measure of the value of liquid and gaseous fuels in the internal-combustion engine, alcohol would have a very poor chance of ever competing with petrol. There are many factors, however, which play an important part in determining the percentage of thermal value which can be converted into power, such as the degree of compression that can be employed without fear of premature ignition, the amount of air needed to produce complete combustion, the rate at which the vapor diffuses through the air creating a uniform mixture, the range over which the mixture is explosive, the possibility of keeping down the cylinder temperature, and other, but little studied points.

It so happens that nearly all these are in favor of alcohol, the use of which enables a higher compression, a cool cycle in the engine, the use of a moderate volume of air, and a greatly-increased range of explosibility of the mixture of alcohol vapor and air, this resulting in making alcohol nearly as effective a fuel as petrol.

Experiments were made in Vienna at the time of the last exhibition there upon two 8 H. P. engines, one designed for petrol and the other for alcohol, and the following results were obtained: Petrol, 340 grams per brake horsepower hour; alcohol, 373.5 grams per brake horsepower hour, the efficiency calculated for the petrol being 16.5 per cent, and for the alcohol 28 per cent; while M. Cheveau, working with a 16 H. P. motor running at 180 revolutions, obtained with alcohol an efficiency of 38 per cent. The chief causes of the higher efficiency of the alcohol are: (1) Compression; (2) amount of air needed for combustion; (3) increased range over which mixture is explosive.

Compression—It is well known that in the gas or vapor engine efficiency increases with increase of compression, and that using petrol as a fuel it is inadvisable to use a compression greater than 90 lbs., while with alcohol 150 lbs. to 200 lbs. can be employed.

Amount of air needed for combustion—As air only contains 20.9 per cent of its volume of oxygen, a vapor which needs a large proportion of air wastes heat by having to raise the temperature of a larger volume of inert gas (nitrogen and products of combustion) than is the case with a vapor requiring a smaller proportion. Petrol, theoretically, requires for each volume of vapor 45.5 volumes of air to give the necessary oxygen to complete combustion and give the highest explosive power, and this means that there should be 2.5 per cent of petrol vapor in the gaseous mixture entering the cylinders; if there be less, the mixture is weaker in explosive power, and there is a large amount of inert products and residual nitrogen to carry off the heat; if there be more, incomplete combustion is the result, and the delicate aroma of the motor is at once recognized.

In order to avoid incomplete combustion an excess of air is mostly supplied, so that generally one and one-half times the theoretical proportion of air is admitted, and each volume of petrol is diluted with about 68 times its own volume of air, four-fifths of which is inert nitrogen taking no part in the action, but so hindering the combustion by dilution that the mixture would not burn at atmospheric pressure, and only becomes explosive under compression.

With alcohol, however, one volume of the vapor will only require 14.3 volumes of air, or about one-third the volume needed by the petrol, and it is much easier with the smaller proportion to get a good mixture, especially as the degree of compression can be so much increased.

When a mixture of petrol vapor and air is made at atmospheric pressure and a light is applied to the mixture, it will just burn when there is 1.25 per cent of the vapor present, and the combustion increases in vigor until it reaches its maximum power with 2.5 per cent, and after that the explosion gets weaker with increase of vapor, until when there is 5.3 per cent it is non-explosive.

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When, however, electrical ignition is used, the range is a little shortened, and it may be stated that the limits of explosion are from 2 per cent to 5 per cent. With alcohol vapor mixed with air the range over which the mixtures are explosive is much wider, and any percentage from 4 to 13.6 of alcohol vapor in air will explode. The value of this extra range must be manifest when one considers the difficulty of getting an exact mixture in the cylinder; indeed, it would be practically impossible were it not for the fact that, both compression and increase of temperature widen the range, and as in the cylinder before explosion compression gives a high temperature, both factors are at work, but the ratio of range for equal compression will probably remain much the same as at atmospheric pressure.

When the introduction of alcohol was first attempted abroad, it was feared that incomplete combustion would give acid products (acetic acid), which would corrode the valves and metal work, but, I am informed, experience with its use in Germany has shown that it is only when running without a load that any tendency to the formation of acid showed itself, and that it was easily got over. Another trouble found at first was that alcohol did not volatize so readily as petrol, so that until the engine got warm there was trouble in getting proper carburation; but this again can easily be got over by a slight alteration in the carburettor, and there are some heavy gravity petrols to be met with on the market which are nearly as bad in this respect.

The great advantages in safety on which I base my plea for experiments to be made with it with the view of replacing petrol for the combustion engines on submarines are that it has a flash point of 58 degs. closed to 64 degs. open, and a boiling point of 173 degs. Fahr., so that, instead of giving off volumes of inflammable vapor at even low temperatures, as petrol does (its flash point being below the freezing point), it is safe at normal temperatures. Alcohol does not "creep" in the same way that petrol does, so there is less fear of leakage from tanks and during storage.

If any escape of alcohol vapor took place, being less than one-half the weight of petrol vapor, it would diffuse more rapidly, and would not flow over the floor space as the petrol vapor does. It requires twice as much alcohol vapor as petrol to make an inflammable mixture with air, and with the alcohol mixture combustion would be the flicker of a blue flame through the air, while with petrol vapor it would be a violent explosion. The most important factor of safety, however, with alcohol is that it mixes with water, and, should a tank of the spirit catch fire, flooding it at once extinguishes it. Petrol, however, having a specific gravity of 0.68 to 0.74, and not mixing with water, floats to the surface, and when once alight is almost impossible to extinguish with the means available afloat.

FAVORS A BIG NAVY.

That there will eventually be a conflict between the yellow race and the white race that will shake the earth is the opinion of Justice John Marshall Harlan of the United States supreme court. In an address before the Navy League of the United States last week, this eminent jurist, according to *The Washington Post*, said:

"If I had the opportunity I would vote for an appropriation of $50,000,000 a year for a period of 10 years for a larger navy. The great importance of a navy is shown in the constitution, which restricts the appropriations for the army, but sets no limit for those for the navy. There is no such thing as friendship between nations as between men. Nations make no sacrifice to preserve friendships and do not forbear to do certain things because they do not meet with the approval of another nation. Do you think England cares a cent for what we think of her navy? Or Germany cares a cent for what we think of her's?

"How large a navy ought we to have? That is a question I cannot answer any more than whether a hospital ship ought to be commanded by a naval officer or a surgeon. I don't care how large a navy we have, but I want to see a navy large enough to take care of the Pacific and Atlantic oceans and our ports on those oceans.

"The trend of the immigration of the white people in the past has been from the east to the west. There has been none from the west. Just across the water there is a country with an immense population whose commerce we are seeking. We refer to the people of Asia as the yellow race. There are 400,000,000 Chinese, as strong physically and mentally as we are.

"There is over there another nation whose people are progressive and ambitious. We may some day see a skilled army in Japan of from 5,000,000 to 10,000,00. They will say: 'You claim Europe as your country. This is ours. Get out!' I don't think they have any such idea now, and we have no hostility toward them. But there will be a conflict between the yellow race and the white race that will shake the earth. When it comes I want to see this country have a navy on both oceans that will be strong enough."

TRANS-ISTHMIAN TRAFFIC.

More than $40,000,000 worth of merchandise originating in United States territory crossed the Isthmuses of Panama and Tehuantepec in 1907, most of it being interchanged between the eastern and western ports of the United States, including the Hawaiian Islands, in this term. This total of more than $40,000,000 of trans-Isthmian traffic in merchandise originating under the American flag is more than three times as much as that of any earlier year.

This sudden and large increase in the interchange between Atlantic and Pacific ports via the narrow strip of land which separates those oceans is chiefly due to the opening early in 1907 of the Tehuantepec Railway, which connects the waters of those two oceans by a land haul of but 190 miles, its termini being Coatzacoalcos on the Atlantic or Gulf of Mexico side and Salina Cruz on the Pacific side. This enterprise of connecting the two oceans by this short land haul of less than 200 miles was planned before the construction of the earliest transcontinental railway in the United States, the first concession for the road having been granted by the Mexican government in 1857. This and subsequent concessions having failed to produce results, the Mexican government in 1882 itself took up the work, making a series of contracts under which a road was completed from ocean to ocean in 1894; but owing to defective conditions its partial reconstruction became necessary, and this reconstruction was accomplished through a partnership arrangement entered into by the Mexican government with a British firm, the road having been actually opened for business in January, 1907. Modern steel docks at the eastern and western termini permit the transfer by steam and electric power of merchandise from the hold of the vessel direct to the car standing on the dock alongside the vessel, and the retransfer from car to vessel by the same manner. The time occupied in shipment across the isthmus is less than 24 hours, and the entire time occupied in the transfer from the hold of one vessel to that of the other vessel less than 48 hours. Regularly established steamship lines now run between Coatzacoalcos, at the Gulf end, and Philadelphia and New York,

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and between Salina Cruz at the Pacific end to the western ports of the United States and the Hawaiian Islands, while various lines connecting with foreign countries also touch at the eastern and western termini.

COMMANDER HOSLEY DIES.

Commander Harry H. Hosley, United States navy, supervisor of the harbor of New York, commander of the towing expedition to Manilla, which took the great dry dock Dewey across the ocean in 1906, died in his room at the New York Yacht Club recently from heart failure, after an attack of grip from which he had been suffering for less than a week.

Up to within a few days the commander was about the club apparently in good health, although there were some of his friends who of late had expressed the conviction that the worry and responsibility of his feat in towing the Dewey 13,080 miles in 193 days had left their mark upon him.

As he himself had often put it, command of the expedition was one involving vast responsibilities, and one in which there was everything for a naval commander to lose and nothing for him to gain. Commander Hosley was eminently successful, as every one knows, in the task for which the government selected him. He was summoned from his office as supervisor of the harbor, and when he arrived at Olongapo and reported the safe arrival of the expedition, he was promptly detached from command and ordered to return to his duties in this city, which he did, going quietly along as though he had never left to command the longest tow on record.

Commander Hosley was born in New Hampshire and entered the Naval Academy in 1871. Graduating in June, 1875, he attained the rank of ensign the following month. He was made master in June, 1882; a lieutenant, junior grade, in 1883; lieutenant in March, 1889; lieutenant-commander in March, 1899, and commander in 1904.

At various times in the course of his service, he served on the Tennessee, Ticonderoga, Vermont, Indiana, and Buffalo, a United States training ship, which he commanded. He made his home in Washington, where he leaves a wife and daughter, but while in this city he lived at the New York Yacht Club, to which organization he was especially devoted. In addition to this club he was a member of the New York Athletic and Lambs' clubs, and to the Naval Order of the United States.

When the dry dock intended for the Philippine Islands was approaching completion in Chesapeake Bay, the navy department began to look about for a man to command the voyage. Hosley had a reputation as a navigator, and a man quick to think and act in emergencies, so he was summoned from New York to Washington and told to prepare for the trip. His reply was characteristic:

"I'll take her over, if she'll hold together," he said.

And so he was placed in command of the Glacier, which had fitted out at Boston under direction of Commander W. F. Fullam, who, it seems, in the preceding October—it was now December—had been tentatively selected to command the expedition. Commander Hosley reported on Dec. 11, the Glacier then lying near the dry dock in the Patuxent river. The question of details was from the first an important matter. How should lights be burned? How should the dock be towed? What signals should be used? Such matters as these engaged the commander's attention constantly up to the date set for unmooring the dock, Dec. 26.

Neither colliers nor dock were allowed to use the general navy signal code, and so resort was made to the international code, which, being found not entirely serviceable, Commander Hosley invented a special set of signals. The delicate task of getting the dock turned around and out of the river, into the bay, and then finally past the Virginia Capes, gave the average naval officer food for thought for the first time, and caused him to reconsider his opinion that the line officers assigned to the task by the government had been placed in a humiliating and disagreeable position. Disagreeable it surely proved to be, but there was little time to think about the hardships and dangers, or, in fact, any of the multiplied incidents of the long tow. Six times, in gales, the dry dock broke loose and went flailing off across the seas, with the Caesar, Brutus, Potomac, and Hosley's boat, Glacier, in full pursuit.

On the first day the expedition made 131 miles, a distance for 24 hours' steaming which they were not to make again until the procession entered the Mediterranean.

An incident in which the seamanship of the commander of the expedition was brought into full play is described by Lieut. Com'dr. F. M. Bennett, who was also on the Glacier, before the Naval Institute.

"The Brutus and Caesar were to tow in tandem ahead, and the Glacier and Potomac, with shorter lines, were to tow from the forward corners," he says. "To give this scheme a trial, the Glacier steamed up to the dock from astern and passed slowly along the starboard side to throw a heaving line aboard. The Potomac, at the time, was towing ahead of the Caesar, and the flotilla was making about 4½ knots.

"At a speed slightly greater than that of the dock, the Glacier passed at a distance of 40 or 50 ft. A heaving line was thrown across, and with it a stout messenger line was hauled over, with which to get the end of the wire-towing hawser aboard the dock.

"When the stern of the Glacier was almost abreast of the starboard forward corner of the dock, that unwieldy craft began one of its kite like swings to starboard. Seeing the distance closing in, Commander Hosley on the bridge of Glacier put the helm to starboard to sheer the stern away from the dock, at the same time ringing up full speed ahead on the engine-room telegraph.

"The dock's movement, however, was too sudden and unexpected to be avoided. Her corner hit us twice, far aft on the quarter; the first time lightly and the next swell heavily, dishing in our plates 12 ft. above the water line. The immediate result of this impact brought us face to face with a genuine peril. The blow had forced the stern of the Glacier over to starboard, the starboard helm assisting, and the ship became pointed diagonally across the interval immediately in front of the dock.

"It was a critical situation, affording no time for reflection, but demanding instant action. To attempt to turn clear with a port helm would result in fouling the propeller in the tow lines. Without hesitation Commander Hosley went ahead on the starboard helm and we actually passed over the tow lines without accident, the ship's stern crossing less than 100 ft. ahead of the on-coming dock. The clipper bow of the Glacier had enabled the vessel to ride down the tow line and force it beneath her keel."

Other adventures followed one another in rapid succession—months of storms and thick weather—out of all of which Commander Hosley emerged triumphantly. The dry dock which he took to the Philippines is now receiving the largest craft.

It is probable that the city of Milwaukee will donate a piece of land in McKinley Park to the United States government as a site for a new life saving station.

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ITEMS OF GENERAL INTEREST.

The Northwestern Steamship Co. and the Alaska Steamship Co. of Seattle have consolidated.

Operations have been resumed at the Canadian Ship Building Co.'s plant at Bridgeburg, Ont., over 250 men having been put to work.

The name of the publication *Technical Literature* has been changed to *The Engineering Digest,* owing to a misapprehension by readers as to the nature of the contents. There is no change, however, in policy or in the character

Capt. J. N. Johnston has been appointed shore captain of the Cleveland-Cliffs Iron Co.'s fleet of vessels. Captain Johnston is the veteran master of this line and last year commanded the W. G. Mather.

Engineer Rear Admiral Henry J. Oram has been appointed engineer-in-chief of the British naval fleet with the rank of Engineer Vice Admiral in succession of Sir John Durston.

The Canadian Pacific Railway Co.'s steamer Mount Temple, bound from Antwerp to St. John, N. B., with over 600 passengers and a large and valuable cargo, struck on the ledges at Iron Bound, on the west coast of Nova Scotia, and will probably become a total wreck. The passengers were landed safely.

The Spence Mfg. Co., St. Paul, Minn., are installing on the docks of the Cunard Steamship Co. at New York three of their portable electric conveyors to load the steamships Lusitania and Mauretania. One of the machines will be 60 ft. long and 3 ft. wide; the other two are 25-ft. machines.

The submarine boat Tarantula, one of the second submarine boat flotilla, traversed exactly 115 knots in the 12-hour endurance test held recently at Newport, R. I. This is considered a remarkable speed for an under-water fighter when the weather conditions are taken into consideration. Her official speed record is exceeded by this performance.

As the result of an involuntary petition in bankruptcy which was filed against the Williams-Whittlesey Co., boat builders at Steinway, L. I., the property of the company is to be sold at public auction to satisfy the 160 creditors who have filed claims. The schedules as filed with Charles A. Tipling, referee in bankruptcy in Long Island City, show liabilities amounting to $57,371.71 and assets valued at $8,191.01. The date of the sale has not yet been fixed.

The Canadian Pacific Railway Co.'s steamer Mount Royal, which was long overdue at St. John, N. B., appeared at Queenstown last week in a badly crippled condition. She left Antwerp Dec. 7 with 300 Hungarian emigrants and a crew of 100 men, but had trouble with her boilers and after encountering a serious gale the trouble was so much aggravated that she was forced to put back for the Irish coast, which she made under her own steam, although at greatly reduced speed.

The old war cruiser Marion was burned to the water's edge recently in Visitation Bay, San Francisco. The Marion was launched in 1875, and was named to perpetuate the memory of the sloop of war Marion, the timber of which was used in the construction of the new vessel. For a time she was in service on the China station but in 1896 she was given to the Naval Reserve as a training ship.

A receiver was recently appointed by Judge Lowell in the United States circuit court at Boston for the Maine Coast Transportation Co., a Maine corporation. The company carries freight between Boston and Maine ports and owns the two steamers Mohawk and Massassoit. The latter went ashore at Cutler's Harbor several days ago. The assets amount to about $25,000 and the liabilities to $20,000 in addition to an issue of bonds amounting to $120,000.

Secretary of the Navy Metcalf, acting under orders from the president, has signed the orders assigning Surgeon Charles F. Stokes to the command of the hospital ship Relief, which is being fitted out at the Mare Island, Cal., navy yard, with a full hospital equipment for special duty with the battleship fleet. It is expected that Surgeon Stokes will start for the coast at once. Other medical officers will be assigned as assistants to the commander and arrangements will be made for shipping a merchant master and crew.

With the sailing on Jan. 4 of the steamship Bunker Hill, a new vessel of 4,000 tons, of the New England Steamship Co.'s line, from Boston for New York, a second all-water freight route began operations. A schedule has been arranged which provides for three sailings weekly from each city, the trips as laid out being made in 24 hours. The new company was organized after a series of conferences between Boston merchants and officials of the New York, New Haven & Hartford Railroad Co., the marine department of which controls the three vessels which will be used in the service.

Sir W. G. Armstrong, Whitworth & Co., Ltd., launched the first-class British battleship Superb, Nov. 7, at their yard on the Tyne. The Superb, although somewhat larger than the Dreadnought, is of the same class and will have a speed of 21 knots. The propelling machinery has been made by the Wallsend Slipway & Engineering Co., Ltd.; there are to be four turbine-driven propellers and an astern turbine is also to be fitted to each of the four lines of shafting. Steam will be supplied by 18 boilers of the Babcock & Wilcox water-tube type and the machinery, with few exceptions, will be an exact duplicate of that of the Dreadnought.

A new departure on the part of the British admiralty was marked by the recent sailing of the admiralty-owned tank steamer Petroleum for Port Arthur, Tex., for the purpose of importing a cargo of oil for use in meeting the increasing requirements of the British navy for oil as fuel, the mosquito fleet in particular being largely propelled by this means. It is the intention of the admiralty to establish a line of depots along the coast where torpedo boats may replenish their supply and a fleet of naval tank steamers which will bring the fuel direct from the oil shipping ports is considered to be the cheapest and most satisfactory method of keeping these depots supplied.

At a regular monthly meeting of the Maritime Association of the port of New York, held recently, a resolution was adopted urging better pay for the life-saving service, in accordance with the bill now pending before congress. The resolution is as follows: "The maintenance of the life-saving service at a high standard of efficiency is of the utmost importance to our shipping interests, and serious conditions at the present time exist in the service, due to the many vacancies continually occurring and the difficulty experienced in filling same with competent recruits, to overcome which it is evident that some inducement must be offered to insure the retention of capable men. There is now pending before congress a bill which provides a system of retirement, insuring compensation to those who may become incapacitated through injury, disease, or by reason of age, which measure it is thought, if enacted into law, would quickly relieve the present critical situation and result in maintaining the life-saving service at the high standard which has caused it to be universally recognized as the leading institution of its kind in the world."

The Independent Pneumatic Tool Co., Chicago, have removed their San Francisco office from 11 Front street to 61 Fremont street.

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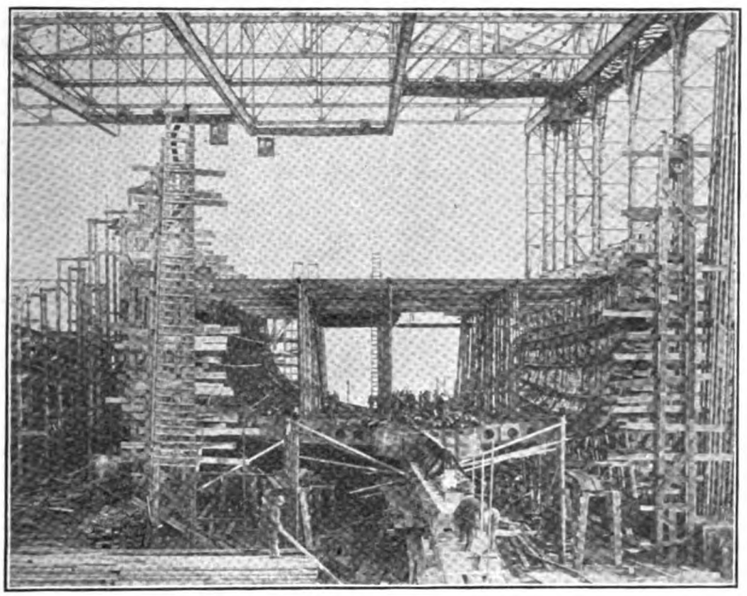
WORK ON BATTLESHIP NORTH DAKOTA.

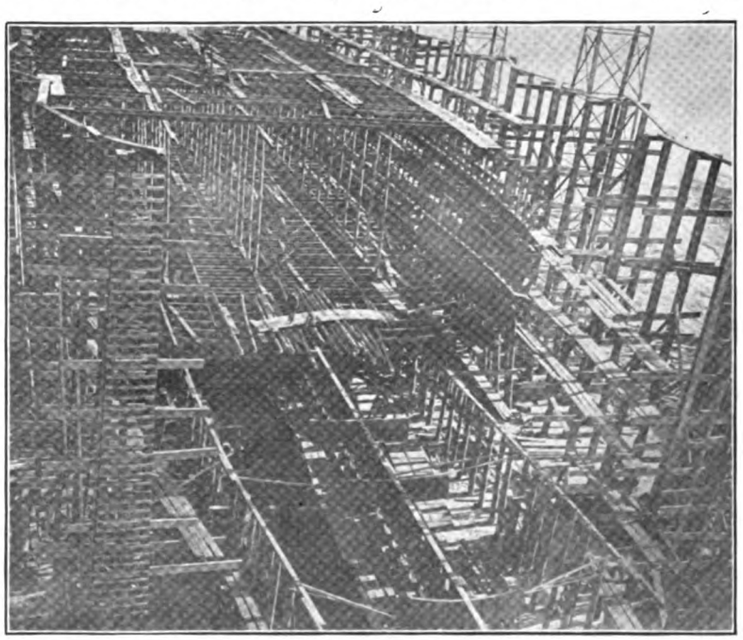
The MARINE REVIEW in its issue of Jan. 16 detailed the progress of work upon the battleship North Dakota now under construction at the yard of the Fore River Ship Building Co., Quincy, Mass., illustrating it with photographs up to Jan. 8. Herewith are published two photographs taken on Tuesday, Jan. 14. The work performed during the intervening week comprised a large number of water-tight frames put in place, some non-water-tight frames; all of the intermediate brackets under the armor shelf; docking keel brackets; many top and bottom bars; longitudinals; additional deck plates, while a large number of additional deck frames, deck and bulkhead plates were put through the shop. About 20 shell plates are in place. The riveting and caulking of the ship is proceeding rapidly.



BATTLESHIP NORTH DAKOTA ON JAN. 14.

FORE RIVER SHIP BUILDING CO.'S YARD.

The ship yard of the Fore River Ship Building Co. of Quincy, near Boston, Mass., although opened only a few years ago, has already become one of the most important plants on the Atlantic coast for the construction of large ships. It would be difficult to find one equipped more completely and embodying more of everything that is latest and best in engineering practice as will be seen from a reading of Allis-Chalmers Co.'s bulletin No. 2034, which, besides containing illustrations of motor applications, gives a description of the various features of electrical equipment furnished by that company, one of the most interesting of which is the system for speed variations. The generator is operated on the two-wire plan, supplying the highest voltage, 240 volts, and on this voltage are operated all the constant speed motors, the crane motors and the lighting system of the yard. For variations of speed, this voltage is divided into three, by means of a balancing transformer, and by proper combinations a number of pressures may be obtained. The system is one in which the impressed electro-motive force upon the armature of a motor is changed to meet the requirements of speed regulation; or, in other words, change of speed is secured by increasing or diminishing the pressure and not by varying the resistance, as is more commonly practiced.



BATTLESHIP NORTH DAKOTA ON JAN. 14.

REORGANIZATION OF CONSOLIDATED LINES.

The reorganization committee of the Consolidated Steamship Lines, the $60,000,000 combine, organized by Charles W. Morse last year, has been increased to eight members by the addition of three practical shipping men. This course was adopted to inspire the confidence of some of the bondholders who had shown an unwillingness to co-operate with the reorganization committee until greater assurances were forthcoming that the rehabilitated company would be free from the Morse influence.

The earnings of the company during 1907, according to a semi-official statement, were sufficient to leave a surplus of $443,800 after paying all fixed charges and interest on the bonds of the controlled underlying companies, and allowing for the deduction of the interest due on the $60,000,000 4 per cent bonds passed on Jan. 1, as well as the $680,000 actually paid on the bonds July 1, 1907. The net income applicable to the bonds after deducting fixed charges and interest on underlying bonds was $2,363,800.

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January 23, 1908.

OCEAN MAIL BILL.

Advices from Washington are to the effect that Senator Gallinger's bill, extending provisions of the Ocean Mail Act of 1891 to second class vessels, will be passed by the present congress. It is difficult to see how congress could fail to pass so necessary a measure. There is great need of better mail communication with remote countries than the United States now enjoys. The Ocean Mail Act of 1891 is the only thing that congress has done for the American merchant marine during the past fifty years. All the ships that the United States has in the foreign trade are due to this measure. Ship building which had languished for years was stimulated by it and any extension of the provisions of the act will result in a corresponding stimulation now. The passage of the Gallinger bill now before congress would result in the immediate placing of contracts with American ship yards for about twenty ships. Such a measure would do much to revive the general state of the industry throughout the country now slowly recovering from the recent financial panic. There is no article of manufacture that employs so many artisans as the building of the ship. Every state in the union must contribute to it. The money spent on a ship is more widely disseminated than any involved in manufacture. Inquiry among the members of the merchant marine committee of the house shows them to be favorable to the measure and the committee on postoffices and post roads is looking after it in the senate. The power of the administration is also back of it, the president having recommended it, the postmaster general having urged it, and the secretary of the department of commerce and labor having devoted a great deal of space in his latest annual report to a discussion of the measure. Opponents of subsidy cannot now quarrel with the bill because it does not call for subsidy. The ocean mail steamers are paid for work which they actually perform and, as a matter of fact in doing so, yield a large profit to the general government. The profit on sea postage is now annually $3,500,000, and while, of course, the projection of new lines could not immediately pay, it is not contemplated to spend more than the profits of sea postage among them. In fact the new lines should show a profit in sea postage after they have become firmly established. Moreover, a mail ship makes an excellent scout and is a valuable auxiliary to the navy.

PRESIDENT LIVINGSTONE'S ANNUAL REPORT.

There are many points of great interest in the annual report of President Wm. Livingstone which was submitted to the Lake Carriers' Association at their meeting in Detroit last week. To begin with the report is the most complete that has ever been made to the association, reaching the dignity of an actual book. So much matter has been incorporated in this report that members will doubtless file it in their libraries for reference. It was evidently the intention of the president that such use should be made of it, as it brings up to date the present state of all improvements affecting lake navigation. Especially complete is the report upon work at the Lime Kilns and the present status of conditions at the Sault. The work at the Sault has been held up for nearly three years by litigation. No sooner has one obstacle been encountered and surmounted than another takes its place. The one arm of the general government, the war department, has worked zealously for nearly three years to begin actual construction work, but the legal arm of the government has for one cause or another interposed and delayed operations. There is hope now, however, that the department of justice is quite satisfied with the quit-claim deed of one of the power companies at the Sault and that the work of construction can shortly begin.

It is a regrettable circumstance that private companies were ever given any privileges in the rapids of St. Mary's river because the time is surely coming when every inch of space will be needed to care for the commerce of the lakes. Work upon the third lock has not yet begun, but President Livingstone in his annual report urges that steps be taken at once for the design of a fourth lock, saying that it will be needed before it is completed, even should the preliminary steps for its construction be taken at once. There is good ground for this view because every lock that has been projected at the Sault, while seemingly ample at the time of its design, proved entirely inadequate to care for existing commerce when it was opened for navigation. The lake trade is one of such amazing elasticity that the engineer who cares for it must be gifted with imagination of a bold order. Practical men are likely to lack this quality. The late Gen. O. M. Poe was gifted with almost prophetic vision and designed his work upon proportions that seemed staggering to less gifted minds; and yet Gen. Poe realized before he died that he had

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actually undershot the mark. The commerce of the great lakes is the wonder of the world. It is stranger than fiction and much more marvel lous than the achievements of Aladdin. Every member of the Lake Carriers' Association should read President Livingstone's report from beginning to end.

JOSEPH H. SPEDDY.

Joseph H. Speddy has been appointed manager of the Lake Transportation Co., with headquarters in the Rockefeller building, Cleveland.

MR. JOSEPH H. SPEDDY.

The new company will engage in a general vessel and insurance business. It has already arranged to represent the Mills fleet in Cleveland consisting of the steamers W. A. Rogers, Charles Weston, W. B. Kerr, L. S. DeGraff, W. M. Mills and Josiah G. Munro. The company will also handle the Cleveland business of Brown & Co. of Buffalo.

While this is Mr. Speddy's initial appearance in the vessel business he has had a long and arduous training as a business man. He was for 10 years in the shipping department of the Standard Oil Co. at Cleveland and for the last two years of his connection with that company had charge of its general construction work. He managed the Smith Premier Typewriter Co. in Cleveland from 1896 to 1900 and was manager of the Columbus office of that company from 1900 to 1906. He was then transferred by the company to St. Paul, Minn., as manager, remaining there until Dec. 31, 1907. Mr. Speddy attended the annual meeting of the Lake Carriers' Association in Detroit last week and displayed great interest in its deliberations.

MULHOLLAND HATCH FASTENERS.

The Mulholland Hatch Fastener Co., Citizens building, Cleveland, has made an agreement with the American Ship Building Co. whereby the ship building company will manufacture the Mulholland hatch fastener upon a royalty basis for the next five years and will incorporate it as part of the standard specifications for the ships that it will build. Capt. Mulholland is now devising a form of strongback to be used in conjunction with the hatch fastener in salt water service. The REVIEW will publish the drawings as soon as they have been completed. This hatch fastener has met with unqualified endorsement throughout the whole lake region.

CAISSON OF NEW INTAKE AT BUFFALO.

The accompanying cut shows the steel shell, or caisson, of the new intake for the Buffalo city water works, the contract for the erection of which is held by the Buffalo Dredging Co. It is shown as it stands at present, the steel construction finished and the whole waiting to be launched and floated to its bed in the Emerald channel at the mouth of the Niagara river in Lake Erie, where considerable concreting is to be added to it. It will be completed in June.

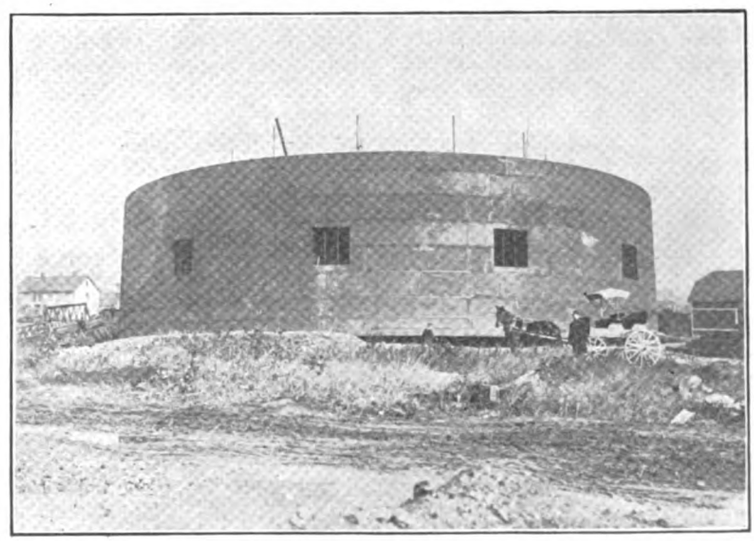
The intake is an enormous steel drum, 25 ft. high and 110 ft. in diameter, inside of which is a second drum 90 ft. in diameter. These two drums are connected by 12 steel lined and grated ports, each six feet square, having water tight gates at their inner ends to control the flow into the intake tank, from which alone the water is to be taken to the city. The space between the two drums and about the port channels is to be filled solid with concrete, so that, if the steel erodes, the intake will nevertheless be intact. The steel shell is, in other words, but a mold.

About 6,000 yards of excavation, to reach a solid rock foundation, will be necessary at the proposed site of the intake and over 9,000 yards of concrete will be used in leveling a bed for the intake and filling that portion of the steel shell that is to be made solid. The intake will be submerged all but about three feet. On its top a building of concrete blocks will be erected and this in turn will be surmounted by a light.

The structural steel work was done by the Van Dorn Iron Works, Cleveland, O., of plates rolled by the Lackawanna Steel Co., and furnished by the Buffalo Dredging Co.

The steel shell weighs approximately 1,000 tons. It will be launched from its present position at the foot of Ohio street, Buffalo, into the Buffalo river and floated of its own buoyancy to its resting place. The cost completed will be about $200,000.

The record cargo of coal during 1907 was carried by the steamer Wm. B. Kerr of the Weston Transit Co.'s fleet. This consisted of 11,751 net tons of soft coal from Lorain to Duluth. The sister ship, Leland S. DeGraff, has already broken this record for the season of 1908. The DeGraff is now at Cleveland and has taken on for winter storage a cargo of 12,441 tons 900 lbs.



CAISSON OF WATERWORKS INTAKE AT BUFFALO.

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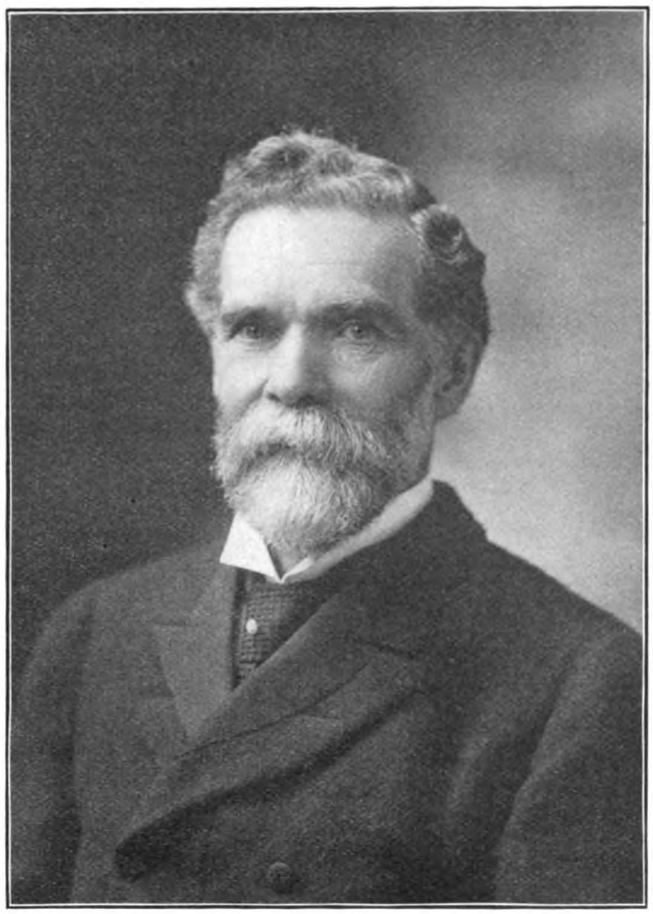
LAKE CARRIERS' ASSOCIATION

The annual meeting of the Lake Carriers' Association was held at the hotel Pontchartrain, Detroit, on Thursday last. As usual the picturesque figure in the preliminary assembling of the members was A. R. Rumsey, chief shipping commissioner, whose duty it has annually been to see that the members assembled in the meeting room promptly at 10 o'clock. He was not, however, as conspicuous as of old, owing to the fact that there is no balustrade overlooking the lobby in the Pontchartrain.

President Livingstone presided and appointed Arthur C. Sullivan and Ralph D. Mitchell as tellers to see if a quorum was present. It was found that out of 17,020 shares of stock, 15,634 were represented. While the count was in progress Harvey D. Goulder, counsel, took occasion to say that the association is not a one man affair or the affair of a dozen men, but is the organization of the vessel owners of the lakes and that every vessel owner should take an interest in the association and attend its meetings and that when delegations go to Washington they should feel that the whole force of the combined vessel interests was back of them.

President Livingstone was unable to be present at the meeting a year ago owing to illness and the association at that time took occasion to present him with a loving cup of exquisite workmanship. It was the first time that the opportunity presented itself to him to thank the members in person as a body for their kind expression of sympathy and this he did with great feeling.



PRESIDENT WILLIAM LIVINGSTONE.

As preliminary to the discussion of his annual report President Livingstone stated that the association had the largest membership and the largest tonnage enrolled in its history and that its single purpose was the improvement and development of lake trade. The association is working for the improvement of the lakes, realizing that whatever is best for the commerce of the great lakes is best for the welfare of the whole people of the United States. This is self-evident in that the saving in freights on the great lakes amounts to about $112,000,000 annually based upon the ton-mile rate of moving freight by rail and water. Every man, woman and child in the United States has benefited by the distribution of so large a dividend. That congress has awakened to this view of the situation is also proved by the fact that it does not now hesitate to spend large sums for necessary improvements, having appropriated for the new channel at the Lime Kilns and the new lock at the Sault approximately $13,000,000.

He took occasion to call the attention of owners to the fact that the contractors are now working on the easterly channel at the Lime Kilns and that all vessels, both up and down bound, would have to use the westerly channel during the season of 1908. This means, of course, that the tremendous volume of commerce bound in both directions must pass through a very narrow strip of water. There are hard and fast rules for navigating this stretch and all vessels passing are under the jurisdiction of the government patrol boat. President Livingstone thought that any master who willfully disobeys these rules should go on the dock as any accident at this critical point might mean the complete blockading of the entire commerce of the great lakes. That portion of President Livingstone's report relating to the Lime Kilns was read by Mr. Goulder. Mr. Goulder took occasion to say that he thought that this new channel when completed should be known as the Livingstone channel.

The report of President Livingstone is unusually complete upon the present status of improvements at the Sault. He stated that some insidious influence was working against the association at the Sault, as it seems impossible to make a start upon the work which is absolutely necessary to care for the growing commerce of the lakes. It was thought that obstacles had been removed when the Chandler-Dunbar Co. offered to give a quit claim deed granting the United States for a nominal consideration the land needed for the widening of the canal, but this quit claim deed the attorney general of the United States has declined to approve. This action on the part of the attorney general was quite surprising to everyone, as

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the war department had accepted the deed and the engineering department had opened bids for the improvement. Three years have elapsed since funds have been available for the prosecution of the work, but owing to the complicated and exasperating legal situation not a single stroke of work has been done. Mr. Livingstone's complete report on this subject is as follows:

STATUS OF WORK AT SAULT.

The status of the proposed widening of the present canal above the locks is as follows:

The attorney general of the United States has declined to approve the quitclaim deed of the Chandler-Dunbar Co. granting the United States for a nominal consideration the land needed for the widening of canal and as the same objections will lie against the deed for lands needed for the new lock, it is not seen how the work on lock can be started before the settlement of this vexatious problem without further special legislation.

The Rivers and Harbors act of March 2, 1907, contained the following clause after the item making the appropriation for the improvement of the St. Mary's river:

"And it is further provided, That the work of improvement shall proceed without delay by reason of conflicting or other claims of title or interests and without prejudice to any pending litigation in reference thereto."

Congress evidently intended to have the work begin at once without waiting for the conclusion of pending litigation, but this proviso was qualified by the succeeding paragraphs of the act, hastily prepared during the last moments of the session, so that an attempt to go on with the work at once would be of doubtful legality in the opinion of those who have been consulted.

A board of engineer officers, consisting of Col. Charles E. L. B. Davis, Col. C. McD. Townsend and Maj. Charles Keller, has this matter now under consideration and will probably render its report within a few weeks. Therefore it is impossible at present to predicate what conclusions the board will arrive at in its report. It is to be devoutly hoped, however, that it may find some solution of this exasperating and vexatious question by which the work can be commenced at once and the legal questions connected therewith be settled later on. In any event, we should in every possible way resist any attempt on the part of anyone to interject into the law any qualifying clauses that will limit the application or give occasion for troublesome litigation on the part of persons claiming to be unjustly treated, who might, by injunction or other legal resorts, still further tie up the work. In other words, the work should be allowed to proceed immediately and any claims for compensation by parties interested should be settled by regular legal procedure without in any way interfering with or delaying the immediate progress of this work.

With reference to the status of the work on widening of canal so long held up by litigation of power companies and to get the latest data possible, I applied to Col. Davis, United States engineer in charge, for the information, and his reply is so clear and lucid, I have given it herewith in full, as it shows the difficulties he has had to contend with:

"Sir:—In answer to your request for information as to the present status of the widening of the upper canal at Sault Ste. Marie, Mich., I have to say:

"First. The River and Harbor act of March 3, 1905, authorized the expenditure under continuing contract of $1,020,000 for widening the upper entrance to the present canal in accordance with project submitted in House Document No. 215, Fifty-eighth congress, third session. Of this $1,020,000 there remains to be appropriated $250,000. This money was to be expended in rock and earth excavation, concrete revetment walls, timber piers, filling, movable dams, including head gates, and superintendence and inspection, all in accordance with the project above mentioned.

"Second. Negotiations for obtaining the land needed for the widening began at once, but as a suit was pending in the United States circuit court to quiet title to islands Nos. 1 and 2, owned by the Chandler-Dunbar Water Power Co., the department of justice advised that no steps be taken to acquire the land until this suit was decided, so the season of 1905 was wasted. In November, 1905, I opened up the question of the land needed and on March 5, 1906, I obtained a quitclaim deed for the nominal consideration of one dollar, and Mr. Chandler was notified March 21, 1906, that the war department accepted the deed. The deed was returned Aug. 8, 1906, with the opinion of the acting attorney general, who found various incumbrances. These incumbrances were purely technical and much time and money were expended by the Chandler-Dunbar company in the effort to remove them but unsuccessfully, and another season's work was lost.

"Finally a second quit-claim deed was prepared for the same nominal consideration and forwarded to Washington May 10, 1907, but was not acted upon by the department of justice until Nov. 25, 1907, and then unfavorably, and the papers have only recently been received back by me. So a third season has passed and we are apparently no nearer a settlement of this question than we were at first, so far as the department of justice is concerned.

"In anticipation of a speedy decision in the matter, for it seemed to me it would be looking a gift horse in the mouth to raise technical points against a gift of a very valuable property for which the government might have been asked a very large sum of money, I prepared specifications for the widening in May, 1906, and bids were opened July 24, of the same year. Six bids in all were received, ranging from $957,200 to $552,530. As the lowest figure was an exceedingly favorable one for the United States, and within the estimate, I recommended its acceptance.

"Aug. 3, 1906, the engineer department notified me that action on my recommendation would have to be deferred until the question of title was settled. The successful bidders were notified of this decision and as no settlement was reached all bids were rejected Sept. 24, 1906.

"In the meantime a good deal of work has been done, a cofferdam has been built around the portion of the work that can be done in the dry, the concrete abutments and foundations for the movable dam—estimated to cost $400,000—have been completed as far as they can before the erection of the steel swing bridge forming the dam proper, specifications for the steel work prepared, and probably the bids for this work will be solicited in February next.

"Third. The condition of the appropriation is in round numbers as follows:

On hand from previous appropriation..	$ 308,000
Already appropriated	770,000
Yet to be appropriated	250,000
Total	$1,328,000
Expended up to date.....	179,360
Balance	$1,148,640

"You will therefore see that so far as this office and the engineer department are concerned every effort has been put forth to start this important public improvement.

"Very respectfully,

"(Signed) CHARLES E. L. B. DAVIS,

"Colonel, Corps of Engineers, U. S. A."

You will note that this appropriation was authorized in March, 1905, that it is now 1908. In other words, almost three years have elapsed since the appropriation was made and the money available for the prosecution of this work lying idle in the treasury, and 75 per cent of the entire commerce of the great lakes held up by the throat, as it were, pending this litigation and technicalities. No problem in connection with the Lake Carriers' Association has come up during my administration on which so much time, worry and annoyance has occurred as in all matters pertaining to work to be done at the Sault. In fact, it is difficult for me to speak temperately on the matter owing to the very many seemingly needless obstructions that have been placed in our way.

In this connection I want it clearly understood that this criticism does not apply in any way to the United States engineer department, for so far as that department is concerned, they have used every possible exertion to start this work, and in conclusion would say that after having followed this matter through every phase and difficulty that has come up since the appropriation was made, I most emphatically endorse every word of Colonel Davis' letter, but am now hoping that the board appointed to solve this difficulty of widening will be able to find a solution and report a plan that will enable the work of widening of the canal at least to re-commence at a very early date. I believe that everything in their power that can be done by this board to accomplish this result will be done.

NEW DAVIS LOCK AT THE SAULT.

It is with great pleasure that we are enabled to report that the recommendations of Colonel Davis relative to the construction of a new lock north of the present Poe lock at Sault Ste. Marie, which were approved by the board of engineers and transmitted to congress by the secretary of war, and by congress referred to the rivers and harbors committee, as stated in our report to the association last year, received the endorsement of that committee and were included in the rivers and harbors bill, which was passed by congress last spring, together with an appropriation of $6,200,000.

Steps should be taken in the near future (not later, in my judgment, than the next session of congress) for the introduction of a bill for the building of a fourth lock, as owing to the length of time it will take to build, it will certainly be needed very much before it can possibly be completed.

It is estimated that the construction of the Davis lock and its approaches will require five years, during which time navigation will have to depend upon the three locks existing at present. The capacity of the Weitzel, Poe and Canadian locks under ordinary conditions is estimated at 75,000,000 tons per annum, and with the traffic during the past year amounting to approximately 60,000,000 tons, it is apparent that we will, before the Davis lock can be completed, if the present rate of increase continues, be urgently in need of the facilities which it will afford.

And as time is such a factor in this case I regret to say that the present vexatious litigation above alluded to does not at the present moment, at least, look favorable to an early commencement of this work. If some way cannot be found outside of condemnation proceedings for the use of land necessary for building the Davis lock and approach, with the legal obstructions that can be thrown in the way by the opposing interests, may consume an amount of time that will bear heavily against the interests of navigation. Deplorable as this state of affairs may seem, it is really the present status of the case so far as the new lock and approaches are concerned. That every effort possible to overcome these difficulties by the United States engineer department, I feel warranted in saying will be made, and that our association will use every effort goes without saying.

The Davis lock will be 1,350 ft. in length and 80 ft. in width, with a least depth of 24.5 ft. below extreme low water, and will have a capacity of 50,000,000 tons during the season of navigation, but with the increasing demand for iron ore and the great and growing increase in the grain production of the northwest, this lock will soon be taxed to the limit of its capacity.

As shown in the chart which accompanied our report last year and again in present report, the upper approach to this lock will be an independent canal 300 ft. in width, so arranged as to provide entrance to a fourth lock when it is needed in the future.

Upon motion of G. A. Tomlinson, thanks were extended to Mr. Livingstone for his complete and comprehensive report. Mr. Goulder took occasion to say that it represented indefatigable labor for a whole year.

Before the morning session Mr. Goulder, in discussing the Chicago drainage canal made a fine plea for the non-depletion of our lake system, at the same time stating that the health of every community from the standpoint of common humanity should be given due consideration.

INSPECTION OF STEAM VESSELS.

At the afternoon session the committee of fleet engineers submitted a report concerning the rules and regulations governing the inspection of steamers. This was one of the most valuable reports submitted to the association and is the result of a year's observation of the new rules formulated by the supervising inspectors of steam vessels. After the report had been read, F. B. Smith, fleet engineer of the Pittsburg Steamship Co., said that it was common to have a

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steamer meet with approval in one district only to find that when she went into another district the inspector would make a different ruling. He also thought that some of the changes in fittings insisted upon by the supervising inspectors at their last annual meeting was putting the vessel owners to expense without any corresponding benefit in security to life and property. The complete report of the fleet engineers will be published in the MARINE REVIEW later.

Harry Coulby, president of the Pittsburg Steamship Co., said that the new rules were full of technicalities, many of them impractical, and for lake vessels, impossible of application. He believed there should be special rules to meet special cases. He thought it also unfortunate that on the lakes there was no practical engineer on the board of supervising inspectors. This was not intended as any reflection upon Captains Stone and Westcott, whose bringing up has been on the forward end of the ship and who are for that reason not practical men when it comes to the consideration of machinery.

The board of supervising inspectors will meet in Washington in a few days and it was decided to appoint a special committee of six from among the fleet engineers to meet with them. This committee consists of F. B. Smith, James Mitchell and Thomas Durkin, of Cleveland, C. J. Fox, of Buffalo, Joseph F. Hayes, of Duluth, and A. Arnold, of Marine City.

Mr. Coulby thought that the auxiliary committee of captains should be a permanent organization, reporting annually to the organization, and moved that such a committee be created. J. H. Sheadle seconded it with the amendment that the members of the committee be appointed for three-year periods, a third expiring each year, so that two-thirds would always hold over and be continually familiar with the business on hand. This was carried.

Major Judson, government engineer at Milwaukee, asked President Livingstone to submit to the association the question of the endorsement of his application for a dredge for the western shore of Lake Michigan. His argument was that a sea-going harbor dredge could go from port to port in any weather and would be immediately available for the instant removal of any bar that might form. Mr. Coulby called attention to the fact that every spring bars formed in the harbors of Fairport, Ashtabula and Lorain and that it was difficult to get them promptly removed until a government dredge was established on Lake Erie. He thought that the Lake Carriers as an association should see that the government engineers get the tools to work with, saying that he was well aware that his point of view would not be favorably received by private dredging interests. A motion was accordingly carried that the sentiment of the association was to the effect that a government dredge should be established on the western shore of Lake Michigan.

Capt. Edward Smith, Capt. C. W. Elphicke and Capt. John Mitchell were appointed as a nominating committee to nominate a board of directors. They nominated the old board with the exception that S. P. Cranage, of Bay City, was elected in place of Charles A. Eddy, of that port, and Capt. Edward Morton, of Cleveland, in place of J. E. Upson, of Cleveland. The board of directors therefore stands as follows: Wm. Livingstone, Detroit; C. W. Elphicke, Chicago; Dennis Sullivan, Chicago; F. W. Smith, Milwaukee; Edward Smith, Buffalo; T. T. Morford, Buffalo; S. P. Cranage, Bay City, A. B. Wolvin, Duluth; J. C. Gilchrist, Cleveland; Harry Coulby, Cleveland; James Corrigan, Cleveland; W. H. Becker, Cleveland; G. A. Tomlinson, Duluth; J. H. Sheadle, Cleveland; John Mitchell, Cleveland; H. D. Goulder, Cleveland; Capt. Edward Morton, Cleveland; G. L. Douglass, Buffalo; H. S. Wilkinson, Syracuse; J. C. Evans, Buffalo; W. A. Hawgood, Cleveland; John E. Payne, Philadelphia, John Craig, Toledo.

The board of directors immediately re-elected the old officers and the executive committee without the formality of leaving the room as follows: Wm. Livingstone, president; J. H. Sheadle, vice president; George P. McKay, treasurer; George A. Marr, secretary; Harvey D. Goulder, counsel.

The executive committee is as follows:

Member.	Alternate.
T. T. Morford	J. C. Evans
Edward Smith	E. T. Douglass
Harry Coulby	Dennis Sullivan
G. A. Tomlinson	W. A. Hawgood
James Corrigan	John Mitchell
J. H. Sheadle	A. B. Wolvin
J. C. Gilchrist	J. A. Gilchrist

Col. Charles E. L. B. Davis, government engineer, addressed the association upon the practicability of creating a straight channel in the lower Detroit river that will do away with five turning points, abolishing the Grassy Island and Mamajuda ranges, making a straight channel 800 ft. wide and five miles long below Wyandotte. He recommended it, not as a pressing necessity but as a desirable improvement to be borne in mind. The MARINE REVIEW will later publish a chart of this new straight channel which can be constructed at the modest expense of $350,000. Col. Davis was desirous of putting the matter in practical shape for subsequent action before his retirement next month.

President Livingstone paid a fine tribute to the life saving service which he regarded as extremely hazardous and most inadequately compensated for by the general government. He believed that action should be taken to provide for age retirement with pay in order that an adequate personnel can be at all times maintained. At present the service is steadily running down for lack of inducement to attract competent men to it. Mr. Goulder supplemented President Livingstone's remarks and a resolution was adopted asking congress to put the life saving service upon the pension roll. This will undoubtedly be done some time, but the quicker it is accomplished the better it will be all around.

Mr. Coulby then introduced a subject which he said that not all of his masters agreed with but which he nevertheless regarded as a desirable thing. That is the abolition of the center ranges. He thought the masters should be content to be guided by the buoys and shore lights and that navigation is actually made more hazardous by having center ranges in the wide channels of the rivers. There is a tendency, doubtless natural, on the part of the masters, to get the range and then hug the center of the channel. As they are all doing the same thing, practically navigating along that one line to the exclusion of the rest of the channel, they are multiplying the chances of collision. Inquiry developed that quite a number of vessel owners felt precisely as Mr. Coulby did and that concerted action may be taken to eliminate the center range lights.

It was the sense of the association that the lighthouse board should adopt the acetylene gas buoy which has been used with signal success in the lower Detroit river.

THE BANQUET IN THE EVENING.

The annual dinner on Thursday evening was the finest occasion that has yet marked the annual gatherings of the association. Letters of regret were read from Gen. Alexander Mackenzie, chief of engineers; Co. W. H. Bixby, Eugene Tyler Chamberlain, Col. W. P. Anderson, Col. F. Gour-

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deau, Major Graham D. Fitch and Commander O. G. V. Spain.

President Livingstone, who presided, said that Col. Charles E. L. B. Davis, government engineer, would retire next month, having reached the age limit. He paid a fine tribute to him, spoke of his invaluable service to the lakes, of his successful life, and hoped that its close would have just clouds enough to make a glorious sunset. He then, on behalf of the association, presented Col. Davis with a loving cup.

Col. Davis, in response, said that he was deeply touched by this mark of esteem, and then facetiously added that judging by its size and elegance the members of the association had also been deeply touched. He renewed his career of 42 years in the government service, of which 15 had been spent on the lakes, and one-fifth of his entire service in Detroit. He referred to the work which had been accomplished under his supervision, taking occasion to say that it had been largely due to the loyalty and devotion of his assistants. He added that the dry process which had been followed with so much success in building a channel at the Neebish would be followed at the Lime Kilns. He referred to the necessity of the establishment of rules in the narrow passages in the rivers, including the stationing of a patrol boat at Port Huron.

The loving cup presented to Colonel Davis was then filled with champagne and passed to everyone seated at the tables.

The principal speaker of the evening was Willis L. Moore, chief of the weather bureau. His address was one of great interest. As illustrating the rapid progress of mankind he said that Benjamin Franklin had known all there was to be known of natural science during his time, but that all that can be expected of any man now is to master one branch of one science. He spoke earnestly of the real value of the work of the weather bureau and regretted that the daily metereological charts are given such scant attention generally. These charts are a compilation of valuable data gathered with great expense by wire and plotted daily showing the movement of storms. If anyone would keep their charts for two or three days, noting thereon the track of the storm from day to day, they could very readily gage its location and direction for the ensuing day. He thought that with a better knowledge of metereological conditions that such a catastrophe as the San Francisco earthquake could be prevented. What he meant was that the great damage could be prevented as it has been proved that buildings can be made earthquake proof. He gave some mighty interesting information on the velocity of tornadoes. The track of the tornado is scarcely more than 1,000 yards wide and they can usually be avoided by running at right angles to them. He also dwelt upon the influence of climate upon races. He said that the northwest wind was the only tonic that has no reactionary influence, the only one that does not borrow from the future.

Col. Townsend, government engineer at Cleveland, paid a tribute to the late Gen. Poe and to Col. Davis for the broad way in which they had developed the channels of the lakes. He related that he had recently prepared a chart of the probable growth of lake commerce but found that the line ran into infinity when pursued for 50 years at the present ratio of increase. He deplored the tendency of towns to utilize the lake front for park purposes, believing that commercial considerations should always first obtain in dealing with a water front. He believed that unless there was a change in this regard destruction might come to our commercial prosperity.

Major Charles Keller, lighthouse engineer, spoke briefly.

Harry Coulby thought that the third lock at the Sault should be known as the Davis lock in honor of its designer. He also thought that the new channel at the Lime Kilns should be known as the Livingstone channel in honor of the man who had always given a dollar's worth of work for 75 cents to the Lake Carriers' Association. He thought no higher tribute could be paid to Mr. Livingstone than to say that his biography would be the history of the time in which he lived. He hoped that on all charts and government documents hereafter the new channel at the Lime Kilns would be referred to as the Livingstone channel. At his suggestion a health was then drunk standing to Mr. Livingstone.

Charles Moore, of the Submarine Signal Co. upon being called upon said that he hardly knew what to say in the presence of so many engineers, as the lighthouse engineers had told him that they had heard all they wanted to from the Submarine Signal Co., and were now waiting to hear from the vessel men. This sally was taken in good part by the engineers. In fact, the annual report of Mr. Livingstone gives the most enthusiastic endorsement of the submarine signal service that has been established on the lakes.

The banquet was brought to a close by brief addresses by Lieut. F. C. Sheredon, of the United States Lake Survey, and Lieut. Windram, of the Revenue Cutter Service.

Those present were: J. H. Sheadle, Harvey D. Goulder, George P. McKay, George A. Marr, A. R. Rumsey, J. C. Evans, G. L. Douglass, C. W. Elphicke, Dennis Sullivan, T. T. Morford, Edward Smith, G. A. Tomlinson, Harry Coulby, John Mitchell, W. H. Becker, J. J. H. Brown, Harvey Brown, Robert T. Gray, A. H. Hawgood, W. A. Hawgood, Capt. C. L. Hutchinson, Walton H. McGean, Capt. W. C. Richardson, Frank Seither, Henry Wineman, Jr., Capt. Ed. Morton, M. J. Cummings, John J. Boland, A. R. Sinclair, L. C. Waldo, J. S. Ashley, Thomas W. Kennedy, Capt. R. W. England, Capt. J. W. Brion, Alfred Mitchell, John F. Wedow, Ralph Mitchell, Henry Steinbrenner, Frank P. Sullivan, W. B. Davock, J. B. Ayers, F. B. Smith, John A. Donaldson, Henry Donaldson, Joseph H. Speddy, W. C. Chapman, John T. Kelley, Wm. Hill, J. A. Gilchrist, A. J. Gilchrist, C. D. Jury, Fred Leckie, Frank Masten, John Scott, James C. Wallace, E. M. Richardson, John M. Mulrooney, George D. Anderson, W. I. Babcock, Henry Penton, Charles Moore, Fred Belcher and J. J. Lynn.

Enroute home from the annual convention of the Lake Carriers' Association at Detroit, Capt. Alfred Mitchell became quite earnest in a discussion of Harry Coulby's suggestion that the center ranges be abolished. He was very emphatic in stating that he not only agreed with Mr. Coulby that they should be abolished but regretted that they had ever been established at all.

"The master that knows his business," said Capt. Al, "does not need the center ranges. He can get along without them. The buoys and shore lights are sufficient for him. When I was sailing we never had any trouble in getting along without them and I think their establishment has been a positive menace to navigation. There were 16 collisions last year between Port Huron and Bar Point. Something's to blame for that, there ought not to be so many. If the

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night is dark and the master does not know where he is it is his business to drop anchor and wait for daylight."

"But," interposed a listener, "suppose during the night another master in your fleet slips by him and gets safely into the lake, gets unloaded and away again while the other fellow is waiting for a dock."

"I wouldn't care for that," said Capt. Al vehemently, "I'd know by the vessel passages what the rest of the fellows did and if I found that only two or three of them slipped by I'd tell him not to try it again. At the most the fellow that anchors can only lose a few hours while the fellow that runs on the beach may lose several days as well as give us a lot of trouble.

"No, sir, those center ranges are not needed. The center of the channel isn't the only part of it fit to navigate. If a man knows his business he does not need those ranges. Take Capt. Charlie Galton. He's been with us for 20 years and has never yet had a collision or put his boat on the beach or had any kind of an accident whatever. That's because he's a careful man and likewise is on to his job. He can get along without the range."

The International Marine Signal Co., Ottawa, Canada, was represented at the annual meeting of the Lake Carriers. This company is manufacturers of automatic acetylene gas buoys and beacons. Complications at the Limekilns during last fall have made the lake carriers look very favorably upon acetylene buoys and especially upon the invaluable assistance of the Canadian government in lighting the channel. Commander Spain of the Department of Marine and Fisheries, after personally visiting the Limekilns in company with President Livingstone and Harry Coulby, placed four buoys at the disposal of the Lake Carriers' Association and they rendered invaluable service at a critical time. This circumstance was not forgotten by the association which at its meeting officially extended a vote of thanks to the Canadian government. The International Marine Signal Co. distributed a beautiful pamphlet descriptive of its floating aids to navigation. In fact, it was testified that the company's automatic buoys were really floating lighthouses, so powerful is their illumination.

The Clark Wireless Telegraph Co. of Detroit gave a demonstration of the principles of wireless telegraphy in one of the rooms of the Pontchartrain during the convention of the Lake Carriers' Association last week. It is actually more impressive to witness a demonstration of this kind within the walls of a single room than it is to be told that the vibrations have been caught from a long distance. There is something uncanny about being able to make bells ring in all parts of the room by simply touching the key of a little portable, detached instrument that one carries around in his hand much as he would an ordinary traveling grip. The Clark company expects by spring to have its stations at Sault Ste. Marie and Duluth in commission.

Percy Donaldson, of Cleveland, addressed the Lake Carriers' convention upon the subject of the wireless telephone. As the hour was late, however, he had practically no opportunity to relate what had been accomplished by wireless telephony or to describe the character of installation. The system, however, is the invention of Dr. Lee DeForest who has equipped the battleship squadron now leaving for the Pacific coast with the radio telephone. It is understood that by means of it Rear Admiral Evans is enabled to talk from his cabin with any of the commanders of his fleet.

W. I. Babcock and Henry Penton attended the annual meeting of the Lake Carriers' Association. The attention of vessel owners was directed to the Atlee Flash Whistle signal which is a device for flashing the signal whenever the whistle is blown. The same movement that blows the whistle automatically flashes the light. This is a palpable boon to masters of vessels as frequently sound does not carry. In the day time this does not always matter because the officer on watch can usually see the steam, but at night it becomes a matter of the utmost concern. With the Atlee whistle signal there can be no uncertainty.

One of the most interesting exhibits at the convention of the Lake Carriers' Association was the indicator designed by the Brown Automatic Signal Co. of Port Huron. The demonstration was in charge of Capt. Cyrus Sinclair. The indicator worked perfectly, showing the impossibility of any error in transmitting orders from pilot house to the engine room. The indicator is being manufactured by the Great Lakes Engineering Works, Detroit. George Brown is president, D. M. Sinclair secretary and treasurer, and Capt. Cyrus Sinclair manager of the Brown Automatic Signal Co.

Charles Moore and J. J. Lynn, of the Submarine Signal Co. were present at the annual meeting of the Lake Carriers' Association. They have reason to congratulate themselves upon the success of their company upon the lakes. Not only have a number of stations bene established at important turning points but the annual report of President Livingstone devotes several pages to submarine signaling and heartily recommends the establishment of a dozen additional stations. There is no doubt that submarine signaling is one of the greatest aids to safe navigation that has ever been invented.

J. E. Rogers, of the Dodd-Rogers Co. of Cleveland, attended the annual meeting of the Lake Carriers' Association. The Dodd-Rogers Co. have recently opened a department of nautical instruments, specializing on the Keuffel & Esser Co.'s products. The company has opened a complete department and is prepared to equip vessels with nautical instruments to the least detail. In addition it is at present conducting a nautical school for the benefit of men aboard lake ships.

Lynn Bros., of Port Huron, agents on the great lakes for the Welin Quadrant Davit, had a very fine working model of the davit at the Lake Carriers' convention and every vessel owner and master that saw the model was loud in his praise of it. It is probable that a number of vessel owners will install this davit on their ships. Over 1,700 of these davits are now in use.

George H. Orton, of the Standard Oil Co. of New York attended the annual meeting of the Lake Carriers' Association.

ORDER FOR FREIGHTER.

John J. Boland, of Buffalo, closed contract last week with the Great Lakes Engineering Works of Detroit for a bulk freighter to come out next June. The new freighter will be 400 ft. over all, 420 ft. keel, 52 ft. beam and 28 ft. deep, and will carry 7,500 tons.

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LUMBER CARRIERS' ASSOCIATION.

The annual meeting of the Lumber Carriers' Association was held at the Hotel Normandie in Detroit last week. Mr. W. H. Teare of Cleveland was elected president; O. W. Blodgett of Bay City, first vice president; E. L. Fisher of Cleveland, second vice-president; A. W. Comstock of Detroit, third vice-president; H. E. Runnels of Port Huron, secretary and treasurer. The new board of managers is as follows: W. E. Holmes, Chicago; O. W. Blodgett, Bay City; W. D. Hamilton, Chicago; H. E. Runnels, Port Huron; Edward Hines, Chicago; J. O. Nessen, Manistee; Wm. M. Sharp, Bay City; H. L. Wilton and C. W. Kotcher, Detroit; Charles Neff, Milwaukee; E. R. McCarty, Saginaw; Henry McMorran, Port Huron; J. G. Garey, Saginaw; C. H. Weeks and A. R. Sinclair, Duluth; John J. Boland, Buffalo; E. L. Fisher, Cleveland; L. S. Sullivan, Toledo; C. H. Prescott Jr., Cleveland; A. W. Comstock, Detroit; C. G Forster, Milwaukee; D. W. Mills, W. G. Spence and E. M. Carleton, Cleveland; H. H. Hettler, V. H. Mashek and H. H. Wood, Chicago.

The recent death of Mr. J. A. Calbick, late president of the association, left vacancies on important committees. Edward Hines of Chicago will succeed him on the finance committee, J. C. Nessen of Manistee on the loading committee, W. E. Holmes of Chicago on the unloading committee and W. H. Woods of Chicago on the towing committee. Charles Neff of Milwaukee will replace S. O. Neff, deceased, on the unloading committee.

A new committee was appointed on labor which will have considerable work ahead of it. The Lumber Carriers represent that they found the year 1907 unprofitable and that it will be impossible to operate during 1908 upon the same basis. In fact a petition is now being circulated by the members agreeing to tie up their vessels at the opening of navigation until the labor problem is satisfactorily adjusted. This agreement will become operative if 75 per cent of the members of the association sign it. Concerning the state of trade the Lumber Carriers issued the following statement at the close of the meeting:

"After a comparison of results for 1907 of the various boats in the lumber trade, it was found by the members that most of them were operated at a loss for the season of 1907—some at a considerable loss. Upon full and lengthy discussion by the owners and managers representing over 85 per cent of the lumber tonnage of the great lakes, it was the unanimous opinion that with the further decreased freight in sight for the coming year, carrying with it a probable reduction in freight rates, it would be impossible to operate the boats for this year under the same conditions and expense as existed during 1907. A labor committee was appointed to devise ways and means for the improvement of past conditions and evils."

The new committee on labor is as follows: W. H. Becker, Cleveland, chairman; Edward Hines, Chicago; C. H. Prescott Jr., Cleveland; W. D. Hamilton, Chicago; O. G. Blodgett, Bay City; J. O. Nessen, Manistee, A. W. Comstock, Detroit; W. H. Sharp, Bay City; H. E. Runnels, Port Huron, and J. C. Garey, Saginaw.

The committee later met with President Keefe of the International Longshoremen, Marine and Transportworkers' Association, but Mr. Keefe was opposed to any reduction in wages. The committee represented, however, that in order to keep the boats in operation it will be necessary to cut down expenses. Further conferences will be held. President Keefe will meet the Lumber Carriers' committee having charge of the loading of lumber at Chicago on Jan. 30.

USEFULNESS OF EMERGENCY STEERING GEARS.

In six seasons there were 168 vessels reported to the newspapers as having had trouble with steering gears. There were, without a doubt, as many more of such a minor nature that were not published. The accidents of record ran from a few hours delay to the complete loss of the ship. In the modern ship, whose gross earning ability is from $500 to $800 every 24 hours, the problem of keeping her from delays that are avoidable is one that must interest every ship owner. If a ship loses her chance at a port of discharge through a breakdown of her steering gear which only requires an hour or so to repair, it means from one to three days waiting for her turn to unload. If she goes ashore in one of the rivers through her steering gear becoming disabled, it generally means from one to 10 days getting released; then three to 30 days in dry dock. The insurance companies pay the damages, etc., but who pays for the lost time? The use of the Akers gear in the rivers, just once, more than pays for itself. One ship used the Akers gear from Lake St. Clair up to Duluth and back down to Erie and then repaired the regular gear without the loss of one minute's time. Ships equipped with the Akers gear have used it to save themselves from grounding and disaster during the past season—entering St. Clair river on a dark night, which, on account of the current, is one of the worst places on the whole chain of lakes; dyke in St. Mary's river, Limekiln crossing, Buffalo, Toledo, without a tug, about to enter Cherry Street bridge. The change from regular to Akers gear was made in every instance practically instantaneously. The original cost of the Akers gear is less than 1 per cent of the first cost of the ship. If it is used once in any of the above mentioned places, it has paid for itself. It is now installed in freighters of all sizes, as well as the largest and most costly passenger ship on the great lakes, the new City of Cleveland. It is not an experiment, and does exactly what is claimed for it, and it will last as long as the ship.

ABRAM SMITH & SON'S YARD.

Abram Smith & Son, Algonac, Mich., have at their ship yard all the work that they can possibly attend to by the opening of navigation. The steamer Portage is being generally overhauled, being fitted with new rudder, new main deck, deck frames, clamps, shelf and bulwarks, new engine and boiler rooms and new cabins for 100 ft. forward of stern. The steamer Langham is undergoing a general overhauling and caulking; steamer Rust caulking and new planking; steamer New York everything new including main deck, bulwarks, spar deck, engine and boiler houses and cabins from stern post to 100 ft. forward; steamer Ida E. new plank and frames in both port and starboard bow and to be caulked from high water mark; schooner W. K. Moore new plank and frames on starboard side and general overhauling; schooner Arenac, general overhauling.

The will of Lord Nunburnholme, the famous ship builder and head of the firm of Thomas Wilson & Sons, Ltd., has been proved at £988,386 2s 2d gross, and £689,526 12s net. The bulk of the money goes to members of the family, but there are some generous contributions to various charities.

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FOR THE LAKE MARINE

In this department hereafter will be found everything of current interest pertaining to Lake Navigation. Masters are advised to consult it weekly for information of interest to them; and owners are invited to use it freely for the promulgation of all announcements of a general nature. The Marine Review will be placed aboard every vessel having membership in the Lake Carriers' Association, representing a registered tonnage of nearly 2,000,000 tons, and can, therefore, be depended upon as a reliable courier to the entire fleet. It will reach every vessel in active service weekly. It is the intention to make this department complete so that at the end of the year it will be an authentic record which should prove of permanent and increasing value to owners and masters alike.

GENERAL CHART OF THE GREAT LAKES.

The United States Lake Survey has just issued a revised second edition of the chart of the great lakes region. It is printed in five colors on a scale of 19 miles to the inch, and is intended for the use of navigators. The chart is big enough to show the whole lake system from Duluth and Chicago to Montreal, and the sheet, 32 inches by 46 inches, is small enough to fit in a master's chart case.

Here are some of the features making it valuable for navigation and allied interests:

Primary sailing courses, with distances, are shown for all the lakes.

Water areas with 3½ fathoms of water or less are shown in blue. The deep water is in white, with the 10, 25, 50, and 100-fathom depths indicated by dotted contour lines. All land areas are in buff tint.

Lines showing the compass variations over the whole region are printed in red. Places where there is a local magnetic disturbance are conspicuously marked.

Curves are given showing the lowest and highest monthly mean heights of the water in each of the lakes from 1860 to 1906.

Tables are incorporated giving lengths, terminal points, and locks with their dimensions, of the United States and Canadian canals tributary to the great lakes.

Tables of dry docks on the lakes with dimensions are given.

Approximate sizes of cities and towns bordering the lakes are indicated by varied symbols and graded scales of lettering.

PROPOSED CHANGES IN HARBOR RULES.

This office has under consideration the enactment of the following additional rule relating to the passing of bridges in Duluth-Superior harbor:

All vessels when passing through open draw bridges shall take the right hand or starboard draw opening at the following bridges: Interstate bridge, Minnesota and Wisconsin draws of Northern Pacific bridge, and the Grassy Point bridge.

The same rule to apply to the Houghton-Hancock bridge at the Keweenaw Waterway.

It is believed that such a rule would tend to reduce the danger of collisions of vessels with each other and with the bridges; and would also, with the exception of a comparatively small proportion of the vessels, facilitate and expedite their passage through the bridges.

It is further proposed to alter rule 21 for Duluth-Superior harbor, relating to the aerial bridge, so as to read as follows:

21. Right of Way. The car shall be run so as to give a clear channel to vessels and shall always keep out of their way. Vessels departing from the Booth dock and other docks between the canal and the Lake Avenue slip, when outbound, will be required to give three short blasts of the whistle at the time of starting from their dock. Vessels are not expected to turn out for the car, except in case the car should be detained over the channel by accident. Vessels which are small enough to pass under the aerial bridge without striking it are not expected to give the signal. Note: The car has a clear height of about 12 ft. above the ordinary stage of water.

This would strike out the requirement for whistling for the aerial bridge in case of vessels making a straight course for the bridge, which is now believed to be unnecessary, and would avoid useless noise.

Before recommending these changes to the department, I wish to obtain an expression of opinion (preferably in writing) from practical navigators, and from bridge owners and others who may be interested, as to the question whether the aforesaid changes would be advantageous and desirable, giving their reasons, for or against.

Communications on this subject should reach this office not later than Feb. 15, 1908. GRAHAM D. FITCH,
Major, Corps of Engineers.
Jan. 18, 1908.

NAVAL CONSTRUCTOR TAYLOR ON SUCTION.

Navy Yard, Washington, D. C.,
Jan. 18, 1908.

Editor MARINE REVIEW:—I have yours of the 13th relative to some newspaper articles stating that I "expressed as a fallacy a theory that has been dwelt upon in a number of collisions on the lakes. That is the matter of suction."

I am quite at a loss to understand what this can be about. I had the pleasure of showing a number of the members of the Association of Passenger Steamboat Lines the model basin, and there was some conversation about suction. I am sure I never said that suction was a fallacy, because I have never doubted its existence. I think I did say that some people discredited suction, because they did not see how two ships traveling close together on parallel courses could be sucked together when the apparent tendency of the water would be to force them apart. This was not my opinion, however, because I went on to explain that by the stream line theory, which is generally acknowledged and which is the basis of much of our work at the model basin, there would inevitably be a strong suction under such circumstances tending to pull the vessels together. The fact that the water is crowded in between two vessels requiring it to move faster causes its pressure to be lower, which many people would not think at first, and hence the pressure on the inner side of the ship would be less than the pressure on the outer side and the difference of pressure would force the ships together. Probably it is this conversation which was misunderstood.

The matter of suction under some conditions can be readily investigated by models, and I have planned to make a little investigation of this at the first convenient opportunity. If you think your readers would be interested, I should be glad to furnish you with some of the results of the experiments. D. W. TAYLOR,
Naval Constructor, U. S. N.

HARBOR OF REFUGE, NORTH SHORE OF LAKE SUPERIOR.

Maj. Graham D. Fitch, government engineer at Duluth, recently transmitted to the war department, the result of inquiry into the necessity of

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establishing a harbor of refuge on the north shore of Lake Superior. Major Fitch sent out letters to about fifty firms living on the north shore of Lake Superior and requested their opinion upon the subject. Eighteen of them replied. All of them, with one or two exceptions, believed that an additional harbor of refuge was needed, seven favoring Two Islands as a location, five Beaver Bay, two Split Rock, one the bay on the east side of Grand Marais Harbor, and one thought it should be located half way between Two Harbors and Grand Marais. Major Fitch concludes after an examination of the subject that there are only two sites, which by location and physical features, are at all adapted for the construction of a harbor of refuge. These are Two Islands and Beaver Bay. He does not think, however, that a harbor could be constructed at either place except at enormous and practically prohibitive cost that would be of much use to the large class of freighters now doing business on Lake Superior. Many of the larger class of freighters now find it difficult to get into Two Harbors in a hard northeast storm where the width of opening between the breakwaters is 1,300 ft. He believes that fog signals would be of more real assistance than a harbor of refuge, saying:

"Many large vessels have been stranded on the north shore between Duluth and Grand Marais, but this has almost invariably happened when the thick weather occurred along with a severe and protracted northeast storm, so that vessels were blown out of their course and were not able to determine their position. Besides this, there is a good deal of local attraction of the compass at several points along the north shore, a description of which may be seen in Lake Survey Bulletin No. 17, pages 15-18, and this has probably drawn the vessels ashore in some instances when they were already out of their course and near the north shore. What would be of more use than harbors of refuge to the larger vessels in stormy thick weather is a number of fog signals to warn them away from the shore, and so distributed that they would always be within hearing of some one of them. For refuge the large vessels would rather run in behind the Apostle Islands than try to make a small harbor along the north shore. On this point see the remarks of the board of engineers already quoted.

"There have not been any great number of disasters to the coasting vessels in the past due to a lack of places of refuge, considering the number of trips made along the north shore. These vessels are at no time farther than 40 miles from one of the existing improved harbors, and at a less distance from some of the small bays or islands where some protection can be had, and navigators have learned to govern themselves accordingly."

AROUND THE GREAT LAKES.

The bulk freighter J. J. H. Brown will be launched from the Lorain yard of the American Ship Building Co. on Saturday, Feb. 8.

The annual ball of the Cleveland lodge of the Ship Masters Association will be held at the Chamber of Commerce on Friday of this week.

The Southern Pacific Co.'s new turbine steamer Creole recently completed a round trip from New York to New Orleans. She was given quite an ovation as she left New Orleans.

First Lieut. George R. Spalding of the engineer corps of the war department has been transferred to the lakes as an assistant to Col. Charles E. L. B. Davis, government engineer at Detroit.

Detroit local No. 3, Marine Engineers' Beneficial Association, have removed their headquarters to 62 Grand River avenue, third floor. The first meeting of the season will be held Dec. 18.

H. S. Noble has been appointed assistant manager and Paul D. Chandler general freight agent of the Mutual Transit Co., with headquarters in the Prudential building, Buffalo, N. Y.

Capt. Edward Chambers of Mackinac Island, who has kept the light at Standard Rock, Lake Superior, for the past 12 years, has been transferred upon his own request to the light at Windmill Point, Detroit river.

The steamer George C. Howe, of the Great Lakes & St. Lawrence Transportation Co.'s fleet, sank at a dock at Kingston last week. The steamer is in shallow water and can be floated without much trouble.

The annual wage conference between the Great Lakes Towing Co. and representatives of the Licensed Tugmen's Protective Association and the tug firemen and linesmen will be held in Cleveland late in February.

At a meeting held by Detroit lodge of the Ship Masters' Association this week a resolution was adopted asking that Washington be fixed as the place to hold all meetings of the Grand Lodge of the association.

The car ferry Manistique No. 1, which sank in the river at Manistique, has been floated and taken to the Milwaukee dry dock for repairs. Capt. Frank Root of the Great Lakes Towing Co. superintended the patching of the break in the car ferry preparatory to the trip to Milwaukee.

Capt. W. C. Richardson has reorganized his business under the name of W. C. Richardson & Co., taking in partnership with him Messrs. W. E. Chapman, T. H. Payne, Clarence E. Richardson and John T. Kelley, who have been for a number of years engaged with him in his office.

At the annual meeting of the Licensed Tugmen's Protective Association held at Detroit this week, T. V. O'Connor, of Buffalo, was elected president; Owen McAntee, St. Joseph, Mich., Wm. H. North, Erie, Pa., R. F. Burrows, Duluth, vice president; H. H. Vroman, Buffalo, secretary; Peter Gagnon, Two Rivers, Wis., treasurer.

The Canadian Ship Building Co. has sold its entire Toronto plant to A. Berg & Sons, Toronto, manufacturer of brick machinery, and will concentrate its operations at the Bridgeburg, Ont., plant, where it controls 125 acres. The reason assigned for the sale is that the machinery does not suit modern requirements, being inadequate for the engine work for large steamers. Berg & Sons will remodel the entire establishment and turn out brick-making machinery employing from 200 to 300 men.

An examination from which to establish a list of persons eligible for appointment as assistant lighthouse keepers in the Tenth lighthouse district, which includes St. Lawrence river and Lakes Ontario and Erie, will be held in the office of the lighthouse inspector at Buffalo, N. Y., on Feb. 15, 1908. Forms of application for examination may be had upon a request addressed to the lighthouse inspector at Buffalo. The age limits are from 18 to 40 years. In the case of persons honorably discharged from the army or navy of the United States the maximum age limit is 50 years.

The following officers were elected by the International Brotherhood of Steam Shovel and Dredgemen: President, Charles Reese; vice presidents, C. E. Newell, Robert Farrell, John Gillooly, William Raines, Alex Laing, Bert Saint John, J. A. Johnson, George Disbrow, S. Cheek and Joseph Painter; secretary-treasurer, T. J. Dolan; directors, L. R. Scudder, William Bates, Michael McGinnis, Fred Brennan, William Russell. The annual conference between the dredge contractors on the great lakes and the brotherhood delegates will be held in Detroit, Feb. 10.

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CLARK WIRELESS SYSTEM.

The Clark Wireless Telegraph and Telephone Co. of Detroit have closed a contract with Jos. H. Reall of Philadelphia on behalf of themselves and associates for the exploitation of the Clark wireless telegraph and telephone system throughout the United States, Canada and South America and ultimately across the Atlantic ocean.

The company has now five operative stations located at Buffalo, Cleveland, Toledo, Detroit and Port Huron, one under construction at Sault Ste. Marie and will shortly install one at Duluth and Pittsburg. Some of the principal lake steamships are already equipped with its system and applications are in hand for many more.

Stations to connect with those already built will be put in as fast as possible at Erie, Pa., Marquette, Mich., Chicago, Milwaukee, St. Louis, Memphis, Atlanta, Cincinnati, Louisville, Indianapolis, New Orleans, Mobile, Jacksonville and thence north along the Atlantic coast to Savannah, Charleston, Wilmington, Norfolk, Richmond, Washington, Baltimore, Philadelphia, Harrisburg, Altona, thence connecting with the Pittsburg station and the Great Lakes system and eastward from Philadelphia to New York, Providence, New Haven, Boston, Portland, St. Johns, thence to Montreal and from Boston to Springfield, Albany, Utica, Syracuse, Rochester, to a connection with the station at Buffalo.

The Clark system has been found to work as well on land as water and has been continuously operated across the Canadian peninsular between Buffalo and Port Huron, a distance of 200 miles, and messages have been sent and received as far as Jacksonville, Fla., 1700 miles. Not only will commercial and shipping messages be handled but press dispatches, of which the company has already handled as many as 10,000 words a day. Last year 70,000 messages were sent and received by the company.

The Clark Wireless Company also owns a wireless telephone invented by Mr. Clark which works successfully up to 15 miles and with sufficent power behind it, can operate 100 miles.

Thomas H. Smith of Sturgeon Bay has been awarded the contract for removing the wreck of the steamer City of Glasgow sunk in the entrance of the channel to Green Bay. His bid was $919.

QUESTIONS FOR WHEELSMEN AND WATCHMEN.

357. The true course is N E ½ E, Var. ½-pt. Ely., what is the correct magnetic bearing?

358. The true course is SSE½E, Var. ½-pt. Wly., what is the correct magnetic course?

359. The true course is WSW, Var. ⅞-pt. Wly., what is the correct magnetic course?

360. The true bearing is NW¼W, Var. ¾-pt. Ely., what is the correct magnetic bearing?

361. The true course from Cleveland to SE shoal is NW by W⅝W, Var. 2½ degrees Wly., what is the correct magnetic course?

362. The true course from Erie to Buffalo is NE½E, Var. ½-pt. Wly., what is the correct magnetic course?

363. Which way do you allow easterly variation to a true course?

364. Which way do you allow westerly variation to a true course?

365. Which way is easterly on the compass?

366. Which way is westerly on the compass?

ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

336. 1.15. In one nautical mile there is 1.15 statute miles.

337. 0.868 called 0.87. One statute miles is 0.87 of a nautical mile.

338. 1.15.

339. 0.87.

340. 1.15.

341. 28.75 statute miles.

342. 28¾ statute miles.

343. Nautical miles.

344. Because in one statute mile there is 0.87 of a nautical mile.

QUESTIONS FOR MASTERS AND MATES.—NO. 56.

738. How does quadrantal deviation change with change of ship's head?

739. On which points of the compass is the quadrantal deviation the greatest?

740. On which points is it the least?

741. Why is it the most on the 4 point courses?

742. Why is it the least on the cardinal points?

743. Why is it that the quadrantal deviation once adjusted that it always remains so in all latitudes?

744. What name does the quadrantal deviation take in the NW and SE quadrants?

745. Supposing the quadrantal deviation was Ely. in the NW and SW quadrants, what would it indicate?

746. If the quadrantal deviation was 6 degrees Ely. on NE what would it be on NNE?

747. What would it be on ENE?

CYCLONE GRATE BAR.

Considerable interest is being manifested by vessel men in the improved type of grate bar being presented to the trade by the Cyclone Grate-Bar Co. of Buffalo, N. Y. It has met with enthusiastic approval wherever used and bids fair to win a strong place in the affections of those interested in fuel economy aboard ship.

The company makes a liberal offer of standing ready to equip any steamship with a set of its bars free, for trial, with the understanding that if they do not prove satisfactory they will be removed without cost and the old ones replaced.

The device has already received a thorough tryout in the engine rooms of several steamships, notably beneath the six Scotch boilers of the Turbinia of the Turbine Steamship Co. of Toronto, Ont., and has given eminent satisfaction in every way.

Briefly, the points of superiority of the Cyclone bar are that its air supply is 68 per cent of its entire surface; that it cannot waste fuel when shaken, as the openings between the bars are no greater in shaking than when locked level; that it locks level and cannot get out of adjustment; is easily dumped; also that the bars are easily removable; that they will burn any kind of fuel; that they are so braced and trussed as to render warping practically impossible; that there are no "fingers" to burn off; that the "filling movement," in shaking, cuts off the ash without disturbing the fire; all of which, summed up, makes greatly for simplicity, durability and economy; finally, that the bars are as near "fool proof" as it is possible to make them.

They are constructed on the clip and truss plan, molded into one piece. There are no bolts in the frame. The equalizing bar slides onto the trunnions of the arms which run down from the ends of the bars and are secured by cotter pins, while a wrought iron rod 1¼ inches in diameter connects the equalizing bar with the shaking and dumping arm on the front of the boiler.

The bars can be shaken vigorously, or gently, having a motion of four inches up and down without opening the spaces between them any farther than when locked level. Their motion is in the nature of a "filing movement," which cuts the ash entirely off

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the bottom of the fire. In dumping their entire load can be expeditiously dropped into the ash pit, as free openings each about 5 inches wide are made between the bars during this process.

Not only are they designed for fuel economy, but they are a saving in themselves on account of their great durability. It is interesting to note in this connection that the company has on display in its offices bars which have seen from 18 months to two years' service and look none the worse for the wear.

SHIP YARD NOTES.

The Booz Bros., Baltimore, Md., have been awarded the contract for repairing the United States government lightship No. 80.

Gardiner G. Deering, Bath, Me., launched the four-masted schooner William L. Wilson recently. She is owned by her builder.

The Colonna Railway Co., Norfolk, Va., has been awarded the contract for repairing the government lighthouse tender Maple for a consideration of $832.

Benjamin Belliveau & Co., Belliveau Cove, N. S., have laid the keel of a three-masted schooner which is to be 98 ft. long, 28 ft. beam, and 9 ft. 8 in. depth of hold.

A. W. Hendry & Son, Liverpool, N. S., launched a tern schooner named Rossignol recently. She is 108 ft. long on the keel, 30 ft. beam and 11 ft. deep. She registers 199 tons.

Robert Jacob, City Island, N. Y., has a contract for building a 57-ft. power boat from designs by Charles D. Mower. The cruiser is designed for use on the St. Lawrence river.

The New London Marine Iron Works, New London, Conn., has recently rebuilt the schooner yacht Fenella, giving her greater length, a new stern and fitting her with an auxiliary gasoline engine.

The Pelly Dry Dock Co., Brooklyn, N. Y., is repairing the steamer Lassell, owned by McCaldin Bros. & Co., New York, which was badly damaged by stranding on the coast of Florida recently.

The Marine Railway, Rockland, Me., has just launched the rebuilt schooner Melissa A. Willey, which has been overhauled at a cost of nearly $10,000. The repairs include new sails, new rigging and new mainmast.

Joseph McGill, of Shelburne, N. S., has been awarded contract by J. A. Lovitt and W. A. Killiam, for the construction of a 90-ton schooner to be used off Yarmouth. The vessel is to be ready for sea in the spring.

The H. D. Bendixsen Ship Building Co., Eureka, Cal., has recently been awarded contract for constructing a steam schooner for the C. H. Higgins Co., to take the place of the Berkeley, which was burned at sea some time ago.

The Moran Co., Seattle, Wash., is engaged in rebuilding the steamship California, owned by the Pacific Coast Steamship Co. When she leaves the ways she will be almost a new vessel, as she will have new boilers, new cabins, and a general refurnishing.

E. Howard, Jeffersonville, Ind., recently launched a big transfer boat for the Chicago & Eastern Illinois Railroad Co., which is one of the largest boats of its kind on western waters, being 225 ft. long, 30 ft. beam, and is fitted with double tracks to carry any kind of cars.

The West End Dry Dock Co., New York, N. Y., have two derrick barges on the stocks which are being built for the Merritt-Chapman Co., of New York, the well-known dredging and wrecking company. These barges are each 110 ft. long, 35 ft. beam, and 10½ ft. depth of side.

Percy & Small, Bath, Me., have been awarded contract by William F. Palmer, of Boston, Mass., for the construction of a five-masted schooner of 3,000 tons, which will be a duplicate of the Davis Palmer, built at the same yard in 1905. Work will be begun in the spring.

The Newport News Ship Building & Dry Dock Co., Newport News, Va., has been awarded contract by the Isthmian canal commission for the construction of four steel dump barges to cost $20,000 each. The company will now have 16 of these barges under order or construction for the commission, at a total cost of $400,000.

The V. P. Baham Ship Yard, Madisonville, La., has been awarded contract by the Bradford Transportation Co., New Orleans, La., for the building of a steamer for the Lower Terrebonne trade. The new vessel is to be 136 ft. long, 23.9 ft. beam, and 5 ft. depth of hold, and she will be completed by April 1.

The Commercial Boiler Works and J. B. Mitchell, Seattle, Wash., who have the contract for effecting repairs to the steamer Elihu Thompson, owned by the Pacific Cold Storage Co., Tacoma, Wash., have nearly completed the work. The repairs are the result of a collision between the Thompson and the Pleiades at Tacoma and several plates on her quarter had to be replaced. She was also given an interior overhauling.

A three-masted schooner was launched at McGill's ship yard at Shelburne, N. S., Dec. 20. She was named the Gay Gordon and is to the order of Harvey & Co., St. Johns, Newfoundland. A 90-ton fishing schooner is being built at the same yard for Irvine A. Lovitt, of Yarmouth, and in addition to this there is a cargo and passenger steamer to be built upon which work will be begun in the spring.

The New England Co., Bath, Me., launched the four-masted schooner Bertha L. Downes, building for the Benedict-Manson Marine Co., of New Haven, Conn., on Jan. 16. The christening ceremony was performed with roses instead of the usual bottle of champagne, owing to Maine having recently become a dry state. The Downes is 175 ft. in length and registers 716 gross tons. Her cost was about $55,000.

W. E. Woodall has in dock a scow for sheathing on bottom for use in Porto Rican waters. This scow with another and a dredge are to be towed to Porto Rico by the tug Chief. The Chief is now being fitted with a towing machine and expects to be ready to start south about the fifteenth. The Danville and Atlantic are at the wharf for a general overhauling and repairs to machinery before resuming their regular winter routes.

Ever since the arrival of the United States army transport Logan from Manila and the announcement that she is in need of extensive repairs, there has been great eagerness on the part of the ship yards of the Pacific coast to get the contract. The approaching visit of the battleship fleet to San Francisco added interest and intensified the desire of the ship builders of the Pacific coast to show the work they are capable of doing. The first specifications issued by the officials called for repairs to the amount of about $500,000. The citizens of Seattle subscribed the sum of $25,000 to help the ship yard on Puget Sound to compete with the San Francisco concerns but this was found to be impossible. The war department decided not to spend so large a sum and issued new specifications. The bid of the Seattle ship yard was far greater than those of the San Francisco builders. The following bids were made: Risdon Iron Works, to finish the work in 182 days, $194,757; Moore & Scott to finish the work in 150 working days; the Union Iron Works, with no limit of time, $219,607. It is probable that the Risdon Iron Works will receive the contract.

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ATLANTIC COAST GOSSIP.

Office of the MARINE REVIEW,
1005 West Street Bldg.,
New York City.

It is reported that two direct steamship lines will shortly be in operation between Canada and France, development of trade under the new Canadian-Franco treaty making an early possibility of establishing a weekly service. The Allan Steamship Co. is making arrangements for a new service on this route, the steamers to sail every three weeks, and the Canadian Pacific has under consideration the establishment of a first-class steamship service to Antwerp, calling at a French port.

In view of the fact that representatives of the Continental steamship companies, who last week held a meeting at Cologne for the purpose of making arrangements for the pooling of the North Atlantic steerage business, have decided to hold a meeting in London to confer with the representatives of the principal British steamship companies, the conference which was to have been held at London on Saturday has been postponed for several weeks. It is predicted that an attempt will be made this week to settle the trans-Atlantic rate war.

The Italian steamship Regina D'Italia, which was held under an attachment obtained by her builders for $1,057,690, has at last sailed from New York. The attachment was issued against the Lloyd Sabaudo Societa Animima de Navigazione de Turine, the corporate name of the steamship company, for money due for vessels built for the firm. The Lloyd Sabaudo would not make the last payment on their steamers because the steamers did not come up to the contracts. All differences, however, have been settled, and the Regina D'Italia, after many false starts, at last departed for Naples and Genoa on the 18th.

The four-masted schooner Bertha L. Downs, the first schooner to be built in the new ship yard of Edward W. Hyde, at Bath, Me., was launched on Jan. 18. She was christened by Miss Bertha L. Downs, daughter of Vice President J. W. Downs, of the Benedict-Manson Marine Co., of New Haven, Conn., for which the craft was built. The Bertha L. Downs will be engaged in the general coasting trade.

The bark Good News sailed on Saturday from the Delaware laden with the most dangerous cargo that has ever left the river. She sailed from Wilmington, Del., for Tacoma, via Cape Horn, the cargo consisting of nearly 2,000 tons of dynamite and other high explosives. The high rates charged by the railroads for carrying explosives are practically prohibitive and, although a cargo has to be carried 14,000 miles farther by water, it can be done that way much cheaper. The Good News is not due at her destination until next summer.

The steamer Monterey, which arrived at New York on Sunday, reported that on Jan. 11, while in the Gulf of Mexico, a peculiar white powder descended on the decks. As there was no grit in the composition of the powder, or dust, it is not believed to be volcanic.

Owing to the heavy weather the Lusitania was unable to make Queenstown on Thursday night, proceeding direct to Liverpool.

The crew of the British steamer Tolesby, which was wrecked at Freshwater Point, near Cape Race, had a narrow escape from drowning. During a thick snow storm the steamer struck on a ledge at the foot of a high cliff, and owing to the breaking seas it was found impossible to launch the boats. The crew took to the rigging, where, later, they were seen and rescued by means of lines lowered from the top of the cliff to the steamer's masts.

The British steamship Inchkeith, from the Tyne for New Orleans, has towed the Danish steamship Polarstjernen to the Bermuda Islands. The Polarstjernen was from West Hartlepool, and had lost her propeller.

The young man whose premeditated death was so rudely interrupted on the steamer Plymouth probably overlooked, when he left the farewell note ashore, the wide range of usefulness to which the wireless telegraphy stations have been put.

The North Atlantic doesn't have 'em all. What is believed to have been a floating derelict was submerged in the tracks of an East river tug on Monday. After colliding with the wanderer the tug was headed inshore, all hands scrambling onto one of the wharfs. The latest bulletin reports the tug also submerged.

The United States local inspectors of steam vessels have suspended the licenses of Capt. Archie Jones, of the motor boat Bentley, and Capt. S. E. Matthews, of the motor boat Lillie, for running their vessels without proper equipment. Both vessels are passenger craft and ply between Chincoteague and Franklin City, Va. The suspension is for 15 days.

HARBOR MASTERS ON THE LAKES.

Following are the harbor masters of the principal ports on the lakes:

CITY.	HARBORMASTER.
Buffalo, N. Y.	John J. Burns.
Dunkirk, N. Y.	John Bourne.
Erie, Pa.	Wm. R. Jordan.
Ashtabula, O.	Sam Cook.
Cleveland, O.	Peter Lynch.
Lorain, O.	Herman Carlsen.
Toledo, O.	Capt. John A. Page.
Detroit, Mich.	Robert Ellison.
Marine City, Mich.	Frank Baker.
Port Huron, Mich.	Chief of Police Henry F. Marx.
Bay City, Mich.	N. N. Murphy.
Saginaw, Mich.	H. Clare Lockwood.
Cheboygan, Mich.	Fred Nelson.
Michigan City, Ind.	Harry M. Miles.
Chicago, Ill.	Walter Scott.
Racine, Wis.	Wm. H. McIlrath.
Milwaukee, Wis.	John McCoy.
Manitowoc, Wis.	Capt. B. Sniffin.
Marquette, Mich.	Anton O. Krueger.
Duluth, Minn.	Thomas Burke.
Sheboygan, Wis.	William Groh.

BIDS FOR DUMP SCOWS.

Bids received by Capt. Earl I. Brown, corps of engineers, U. S. army, Wilmington, N. C., opened Jan. 10, for constructing two six-pocket bottom dump scows, were as follows:

American Car & Foundry Co., Wilmington, Del.	$44,600.00
Sanford & Brooks Co., Baltimore, Md.	36,630.00
Southern Ship Building Co., Tottenville, N. Y.	37,900.00
Newport News Ship Building & Dry Dock Co., Newport News, Va.	30,500.00
B. K. Richardson, Nario, Fla.	33,600.00
Wilmington Iron Works, Wilmington, N. C.	39,977.77
Smith & Robinson, Philadelphia, Pa.	33,380.00
Louis H. Skinner, Wilmington, N. C.	31,800.00
American Car & Foundry Co., Wilmington, Del.	39,600.00

PIG IRON SITUATION.

Less activity is prevalent in pig iron following the somewhat livelier market of a week ago, though there is a desultory buying movement of near-future needs in some sections. Southern prices of $12.50 and $12 are reported. Some of the steel interests are expressing a wish for the reaffirmation of the ore prices of 1907, but other companies not owning mines are not so ready to concur in this sentiment. Because of the large amount of ore on docks and in furnace yards, it seems probable that no definite action in prices will be taken for some time. Only a light business is moving in finished lines. Prices are fairly well sustained except in cast iron pipe and light rails.

The old naval dry dock at Port Royal, S. C., is to be sold at auction Jan. 28. The dissolution of the naval dock at that port has been progressing for some time and for all practical purposes it has been abandoned.

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BIDS FOR NAVAL SUPPLIES.

Bids received at the bureau of supplies and accounts, navy department, Washington, D. C., opened Jan. 2, for material and supplies for the navy yards, included the following:

Class 41—Mare Island—45,000 Yards Khaki-Dyed Cotton Canvas.

Otto Geotze, 108 Worth St., New York $19,277.50
J. H. Meyer & Co., 75 Worth St., New York 18,981.75

Class 42—Mare Island—7,000 Yards Flax Canvas.

De Grauw, Eymer & Co., 34 South St., New York ..... $ 4,072.30
O'Jaffe & Pinkus, 103 Franklin St., New York 4,095.00

Class 61—Newport News and Quincy, Mass.—20 Motors.

General Electric Co., Schenectady, N. Y. $20,430.00
B. F. Sturtevant Co., Hyde Park, Mass, ... 21,100.00
Western Electric Co., 463 West St., New York ..... 13,565.00 / 14,315.00

Class 62—Newport News and Quincy, Mass.—20 Motors.

General Electric Co., Schenectady, N. Y. $12,430.00
B. F. Sturtevant Co., Hyde Park, Mass. 9,900.00
Western Electric Co., 463 West St., New York ..... 7,415.00 / 8,075.00

Class 63—Newport News and Quincy, Mass.—20 Master Controllers.

Cutler-Hammer Mfg. Co., Milwaukee, Wis. $11,800.00
General Electric Co., Schenectady, N. Y. 24,330.00
Otis Elevator Co., 17 Battery Pl., New York 36,500.00
James Schawel, 27 John St., New York 16,640.00

Class 64—Newport News and Quincy, Mass.—20 Master Controllers.

Cutler-Hammer Mfg. Co., Milwaukee, Wis. ..... $ 9,840.00
General Electric Co., Schenectady, N. Y. 17,760.00
Otis Elevator Co., 17 Battery Pl., New York 30,800.00

Class 65—Newport News and Quincy, Mass.—20 Shunt Motors.

Diehl Mfg. Co., Elizabethport, N. J. ..$14,273.20
General Electric Co., Schenectady, N. Y. 11,240.00
Lincoln Motor Works Co., Caxton Bldg., Cleveland, O. 5,900.00
B. F. Sturtevant Co., Hyde Park, Mass. 9,860.00
Western Electric Co., 463 West St., New York ..... 5,670.00 / 6,720.00

Class 66—Newport News and Quincy, Mass.—20 Series Motors.

Diehl Mfg. Co., Elizabethport, N. J. ..$ 9,524.00
General Electric Co., Schenectady, N. Y. 4,140.00
B. F. Sturtevant Co., Hyde Park, Mass, ... 5,360.00
Western Electric Co., 463 West St., New York ..... 2,515.00 / 3,045.00

Class 67—Newport News and Quincy, Mass.—20 Complete Controllers.

Cutler-Hammer Mfg. Co., Milwaukee, Wis. ..... $ 1,950.00
General Electric Co., Schenectady, N. Y. 5,290.00

Class 68—Newport News and Quincy, Mass.—20 Shunt Motors.

Diehl Mfg. Co., Elizabethport, N. J. ..$ 4,976.00
General Electric Co., Schenectady, N. Y. 4,080.00
Lincoln Motor Works Co., Caxton Bldg., Cleveland, O. 3,200.00
B. F. Sturtevant Co., Hyde Park, Mass. 3,240.00
Western Electric Co., 463 West St., New York ..... 2,730.00 / 4,230.00

Class 117—New Orleans—450 Lbs. Square Flax Packing.

Brooklyn Forge & Supply Co., 21 Franklin St., Brooklyn, N. Y. ..... $ 126.00
R. W. Geldart, 2 Stone St., New York 91.80
Garlock Packing Co., 95 Liberty St., New York 135.00
Manning, Maxwell & Moore, 85 Liberty St., New York 138.60
Manhattan Supply Co., 127 Franklin St., New York 111.15
O. K. Olsen, 901 Carondelet St., New Orleans, La. 114.75
Quaker City Rubber Co., 629 Market St., Philadelphia, Pa. 99.00
William R. Thompson, 704 Lafayette Ave., Brooklyn, N. Y. 76.50
Fairbanks Co., 900 Camp St., New Orleans, La. 135.00
Class 118—New Orleans—800 Lbs. Tuck's Packing.

Diamond Rubber Works, 1826 Broadway, N. Y. ..... $ 512.00
B. F. Goodrich Co., Akron, O. 365.50
S. R. Fletcher & Co., 26 Cortlandt St., New York 622.50
Gutta Percha & Rubber Mfg. Co., 126 Duane St., N. Y. 528.00
R. W. Geldart, 2 Stone St., New York 480.00
Garlock Packing Co., 95 Liberty St., New York 544.00
Old Dominion Paper Co., 98 Commercial Pl., Norfolk, Va. 639.20
O. K. Olsen, 901 Carondelet St., New Orleans, La. 268.75
Fairbanks Co., 900 Camp St., New Orleans, La. 346.50

Class 119—New Orleans—400 Lbs. Sheet Rubber Packing.

Boston Belting Co., 256 Devonshire St., Boston, Mass. ..... $ 480.00
Double Service Packing Co., 413 Walnut St., Philadelphia, Pa. 377.68
Diamond Rubber Works, 1826 Broadway, New York 332.00
B. F. Goodrich Co., Akron, O. 336.00
Gutta Percha & Rubber Mfg. Co., 126 Duane St., New York 376.00
O. K Olsen, 901 Carondelet St., New Orleans, La. 148.50
Trenton Rubber Mfg. Co., Trenton, N. J. 392.00
Vorhees Rubber Mfg. Co., 48 Dey St., New York 296.00
Fairbanks Co., 900 Camp St., New Orleans, La. 360.00
American Supply Co., 16 South Commerce St., Mobile, Ala. 480.00

Class 125—New Orleans—Quantity of Brass Globe Valves, Angle Valves, Check Valves and Cross Valves.

Buckeye Iron & Brass Works, Dayton, O. ..... $ 1,840.50
Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md. (part) 2,100.00
Hartman & Co., 1231 North Front St., Philadelphia, Pa. (part) 2,257.00
E. F. Keating Co., 452 Water St., New York 3,027.50
Knox & Bro., 96 John St., New York 2,673.50
Lunkenheimer Co., Cincinnati, O. (part) 1,985.00
Montgomery & Co., 105 Fulton St., New York 2,802.00
Manning, Maxwell & Moore, 85 Liberty St., New York 2,717.48
Manhattan Supply Co., 127 Franklin St., New York 2,430.00
O. K. Olsen, 901 Carondelet St., New Orleans, La. (part) 10,185.00
Fairbanks Co., 900 Camp St., New Orleans, La. 2,916.50

Class 126—New Orleans—400 Brass Gate Valves.

Bridgman Bros. Co., 1402 Washington Ave., Philadelphia, Pa. (part) ..... $ 578.00
Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md. (part) 660.00
E. F. Keating Co., 452 Water St., New York 757.50
Manning, Maxwell & Moore, 85 Liberty St., New York 1,574.50
Manhattan Supply Co., 127 Franklin St., New York 1,161.50
Old Dominion Paper Co., 98 Commercial Pl., Norfolk, Va. 2,885.00
William Powell Co., 2521 Spring Grove Ave., Cincinnati, O. 1,371.00
Fairbanks Co., 900 Camp St., New Orleans, La. (part) 531.50

Class 194—Brooklyn—4,950 Lbs. Oakum.

H. E. Boucher Mfg. Co., 91 Maiden Lane, New York ..... $ 326.70
Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md. 341.55
R. W. Geldart, 2 Stone St., New York 281.16
C. H. Langdon, 84 White St., New York ..... 2.98c to 6.73c per lb.
Montgomery & Co., 105 Fulton St., New York 282.15
Manning, Maxwell & Moore, 85 Liberty St., New York 297.00
Old Dominion Paper Co., 98 Commercial Pl., Norfolk, Va. 321.25
William Wirt Clark & Sons, 546 Monument St., Baltimore, Md. 297.00
Excelsior Equipment Co., Pittsburg, Pa. 297.00

Class 216—Brooklyn—1,000 Lbs. Vulcabeston Rope Packing.

Garlock Packing Co., 95 Liberty St., New York ..... $ 700.00
H. W. Johns-Manville Co., 100 William St., New York 850.00
E. F. Keating Co., 452 Water St., New York 700.00
Manhattan Supply Co., 127 Franklin St., New York 550.00

BIDS FOR NAVAL SUPPLIES.

Bids received at the bureau of supplies and accounts, navy department, Washington, D. C., opened Dec. 26, for material and supplies for the navy department, included the following:

Class 22—Mare Island—25,000 Lbs. Chain.

Baker & Hamilton, 900 Third St., San Francisco, Cal. $1,411,20
Dunham, Corrigan & Hayden Co., 100 Kansas St., San Francisco, Cal. 1,257.48
Richard H. Grey, East Oakland, Cal. 1,380.96
Hayden-Corbett Chain Co., 250 Fulton St., New York 1,184.40
Manning, Maxwell & Moore, 85 Liberty St., New York ..... 1,543.20 / 1,618.56
Manhattan Supply Co., 127 Franklin St., New York 1,688.40
Nicholson & Co., Rankin, Pa. 1,789.20
Charles E. Robidoux, San Francisco, Cal. 1,209.60

Class 156—Portsmouth—Angle and Globe Valves.

Bridgman Bros. Co., 1426 Washington Ave., Philadelphia, Pa. ..... $ 837.60
Buckeye Iron & Brass Works, Dayton, O. 804.48
Central Metal & Supply Co., 609 Lombard St., Baltimore, Md. 859.92
R. W. Geldart, 2 Stone St., New York 735.12
Handlau-Buck Mfg. Co. St. Louis, Mo. 806.72
Knox & Bro., 96 John St., New York. 729.93
E. F. Keating Co., 452 Water St., New York 870.96
Lunkenheimer Co., Cincinnati, O. 848.40
Manning, Maxwell & Moore, 85 Liberty St., New York 786.42
Manhattan Supply Co., 127 Franklin St., New York 796.68
Montgomery & Co., 105 Fulton St., New York 783.36
William Powell Co., Cincinnati, O. 846.12

Class 157—Brooklyn—Brass Angle Valves.

Bridgman Bros. Co., 1426 Washington Ave., Philadelphia, Pa. $1,989.70
Buckeye Iron & Brass Works, Dayton, O. 1,922.58
Central Metal & Supply Co., 609 Lombard St., Baltimore, Md. 1,946.35
R. W. Geldart, 2 Stone St., New York 1,742.50
Handlau-Buck Mfg. Co., St. Louis, Mo. 2,108.44
Knox & Bro., 96 John St., New York. 1,742.23
E. F. Keating Co., 452 Water St., New York 2,135.00
Lunkenheimer Co., Cincinnati, O. 2,021.04
Manning, Maxwell & Moore, 85 Liberty St., New York. 1,810.40
Manhattan Supply Co., 127 Franklin St., New York 1,975.69
Montgomery & Co., 105 Fulton St., New York 1,815.15
William Powell Co., Cincinnati, O. 2,068.68

Class 158—Brooklyn—Two Dozen Brass Globe Valves.

Bridgman Bros. Co., 1426 Washington Ave., Philadelphia, Pa. ..... $ 396.00
R. W. Geldart, 2 Stone St., New York 384.90
Knox & Bro., 96 John St., New York. 380.06
Lunkenheimer Co., Cincinnati, O. 300.00
Manning, Maxwell & Moore, 85 Liberty St., New York. 409.50
Manhattan Supply Co., 127 Franklin St., New York 318.00
William Powell Co., Cincinnati, O. 497.52

Class 159—Boston—Eight Dozen Brass Check Valves and 50 Dozen Brass Globe Valves.

Buckeye Iron & Brass Works, Dayton, O. ..... $ 426.48
Central Metal & Supply Co., 609 Lombard St., Baltimore, Md. 533.00
R. W. Geldart, 2 Stone St., New York 426.30
Lunkenheimer Co., Cincinnati, O. 506.52
Manning, Maxwell & Moore, 85 Liberty St., New York. 444.24
Manhattan Supply Co., 127 Franklin St., New York 430.85
Montgomery & Co., 105 Fulton St., New York 440.70
William Powell Co., Cincinnati, O. 497.52

Class 160—Boston—20 Dozen Brass Gate Valves.

Bridgman Bros. Co., 1426 Washington Ave., Philadelphia, Pa. ..... $ 394.00
Central Metal & Supp' Co., 609 Lombard St., Baltimore, Md. 380.00
E. F. Keating Co., 452 Water St., New York 300.00
Manning, Maxwell & Moore, 85 Liberty St., New York 624.00
Manhattan Supply Co., 127 Franklin St., New York 460.00
William Powell Co., Cincinnati, O. 744.00

Class 161—Brooklyn—50 Dozen Brass Gate Valves.

Central Metal & Supply Co., 609 Lom-

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bard St., Baltimore, Md.....$3,501.00
Manning, Maxwell & Moore, 85 Liberty St., New York..... 5,652.24
Manhattan Supply Co., 127 Franklin St., New York 4,867.40
William Powell Co., Cincinnati, O.... 4,962.60

BIDS FOR NAVAL SUPPLIES.

Bids received at the bureau of supplies and accounts, navy department, Washington, D. C., opened Jan. 14, for materials and supplies for the navy yards, included the following:

Class 36—Mare Island—2,000 Lbs. Calking Cotton.

R. P. Clarke Co., Washington, D. C...$390.00
W. W. Clarke & Son, Baltimore, Md.. 260.00
R. W. Geldart, 2 Stone St., New York. 400.00
Old Dominion Paper Co., Norfolk, Va.. 299.80
John Rothschild & Co., 11 Spear St., San Francisco, Cal..... 285.80
Excelsior Equipment Co., Pittsburg, Pa. 366.66
Charles K. Howe, 61 Market St., San Francisco, Cal..... 330.00

Class 134—4,800 Lbs. Oakum and 1,600 Lbs. Calking Cotton.

Avery Hardware & Supply Co., Pensacola, Fla. $580.00
W. W. Clark & Son, Baltimore, Md... 497.36
R. W. Geldart, 2 Stone St., New York. 602.40
Motley, Green & Co., 66 Broad St., New York 593.60
Miller & Graham, Baltimore, Md..... 524.80
Marine Mfg. & Supply Co., 158 South St., New York 560.80
Old Dominion Paper Co., Norfolk, Va. 560.64
J. B. Roache, 350 Fulton St., Brooklyn, N. Y..... 567.68
Vermilye & Power, 17 Battery Place, New York 485.60
Excelsior Equipment Co., Pittsburg, Pa. 560.00

Class 238—Annapolis—About 250 Brass Globe Valves.

Bridgman Bros. Co., 1422 Washington Ave., Philadelphia, Pa.....$278.05
Buckeye Iron & Brass Works, Dayton, O. 292.45
Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md..... 311.16
Fairbanks Co., Baltimore, Md..... 287.64
R. W. Geldart, 2 Stone St., New York. 262.39
Handlau-Buck Mfg. Co., St. Louis..... 326.14
E. F. Keating Co., 452 Water St., New York 299.90
Knox & Bro., 96 John St., New York.. 258.63
Lunkenheimer Co., Cincinnati, O..... 293.00
Manhattan Supply Co., 127 Franklin St., New York 280.44
Excelsior Equipment Co., Pittsburg Pa. 417.85

CANAL CIRCULAR NO. 411.

Bids received by the general purchasing officer of the Isthmian canal commission, Washington, D. C., on Jan. 13, for material and supplies for the Panama canal, included the following:

Class 10—98 Brass Valves.

Ahrens & Ott Mfg. Co., Baronne and St. Joseph Sts., New Orleans.....$255.00
Crane Co., Baltimore, Md..... 336.63
Fox Bros. & Co., 126 Lafayette St., New York 409.68
E. F. Keating Co., 452 Water St., New York 419.66
Manhattan Supply Co., 127 Franklin St., New York 364.74
William Powell Co., 2521 Spring Grove Ave., Cincinnati, O..... 157.00

Class 11—21 Float Valves.

Ahrens & Ott Mfg. Co., Baronne and St. Joseph Sts., New Orleans, La....$676.80
Central Metal & Supply Co., 609 E. Lombard St., Batlimore, Md..... 504.00
Cuyler & Mohler, Baltimore, Md..... 719.10
Fox Bros. & Co., 126 Lafayette St., New York 697.80
Golden-Anderson Valve Co. Specialty Co., Pittsburg, Pa..... 528.00
E. F. Keating Co., 452 Water St., New York 742.20
Kieley & Muller, 34 W. 13th St., New York 352.50
J. K. Larkin & Co., 34 Reade St., New York ..... } 677.40 577.35
Manning, Maxwell & Moore, 85 Liberty St., New York 604.38
Sherman-Brown-Clements Co., 80 Murray St., New York..... 702.30

Class 79—12 Marine Clocks.

Bridgman Bros. Co., 1426 Washington Ave., Philadelphia, Pa.....$242.16
Chelsea Clock Co., 18 State St., Boston, Mass. 183.00
Fox Bros. & Co., 126 Lafayette St., New York 171.96
J. K. Larkin & Co., 34 Reade St., New York 384.00
Manhattan Supply Co., 127 Franklin St., New York 34.80
Manning, Maxwell & Moore, 85 Liberty St., New York 240.00
Sherman-Brown-Clements Co., 80 Murray St., New York..... 231.00
Vermilye & Power, 17 Battery Pl., New York 179.88

BIDS FOR DREDGING.

Bids received at the U. S. engineer office, Twenty-second and K streets, N. W., Washington, D. C., on Jan. 11, for dredging in the Rappahannock river, were as follows:

	Cents per cu. yd.
Atlantic Dredging Co., Philadelphia, Pa.	29
Miner Engineering Co., Washington, D. C.	22½
Maryland Dredging & Contracting Co., Baltimore, Md.	15¼
American Dredging Co., Philadelphia, Pa.	17
Bowers Hydraulic Dredging Co., Camden, N. J.....	14.90
P. Sanford Ross, Inc., Jersey City, N. J.	19.48
Sanford-Brooks Co., Baltimore, Md.....	17
Davis & French, Norfolk, Va.....	27.39

CANAL CIRCULAR 407.

Bids received by the general purchasing officer of the Isthmian canal commission, Washington, D. C., opened Jan. 2, for material and supplies, included the following:

Class 1—Ashcroft Gauges and Repair Parts for Same.

Manning, Maxwell & Moore, 85 Liberty St., New York .....$ 612.72

Class 2—Repair Parts for Crosby Steam Gages and Valves.

Fox Bros. & Co., 126 Lafayette St., New York .....$ 432.34
E. F. Keating Co., 453 Water St., New York 603.54
Manning, Maxwell & Moore, 85 Liberty St., New York 534.25
Motley, Green & Co., 66 Broad St., New York 555.39
Vermilye & Power, 17 Battery Pl., New York 527.10

Class 3—Kinkle Valves and Parts for Same.

Bridgeman Bros. Co., 1426 Washington Ave., Philadelphia, Pa.....$ 555.10
Fox Bros. & Co., 126 Lafayette St., New York 480.12
E. F. Keating Co., 453 Water St., New York 486.80
Manning, Maxwell & Moore, 85 Liberty St., New York..... 479.44

Class 4—American Pop Safety Valves and Parts for Same.

American Steam Gauge & Valve Mfg. Co., 220 Camden St., Boston, Mass., (part) .....$ 466.52
E. F. Keating Co., 453 Water St., New York 140.00

Class 5—Ashton Pop Safety Valves and Parts for Same.

Ashton Valve Co., 271 Franklin St., Boston, Mass., (part) .....$ 228.00
Bridgeman Bros. Co., 1426 Washington Ave., Philadelphia, Pa., (part) . 256.80
Fox Bros & Co., 126 Lafayette St., New York (part) 237.00
R. W. Geldart, 2 Stone St., New York (part) 238.80
E. F. Keating Co., 453 Water St., New York 256.80
Manning, Maxwell & Moore, 85 Liberty St., New York (part)..... 239.76
Vermilye & Power, 17 Battery Pl., New York (part) 238.80

Class 6—Nathan Safety Pop Valves and Parts for Same.

Bridgeman Bros. Co., 1426 Washington Ave., Philadelphia, Pa.....$2,628.94
Nathan Mfg. Co., 85 Liberty St., New York 2,159.40

Class 7—16 Pop Safety Valves and 12 Ball and Lever Safety Valves.

Ahrens & Ott Mfg. Co., Baronne & St Joseph Sts., New Orleans La.....$ 402.80
Bridgeman Bros. Co., 1426 Washington Ave., Philadelphia, Pa..... 444.80
Crane Co., 624 West Pratt St., Baltimore, Md. 403.16
Fox Bros. & Co., 126 Lafayette St., New York 488.40
E. F. Keating Co., 453 Water St., New York 449.00
Manning, Maxwell & Moore, 85 Liberty St., New York (part)..... 540.00
Vermilye & Power, 17 Battery Pl., New York (part) 288.00

BIDS FOR BUILDING TENDER.

Bids for building two wooden hull steam tenders for use at Paducah, Ky., received by Major William W. Harts, corps of engineers, United States army, Nashville, Tenn., and opened Dec. 27, were as follows:

Charles Barnes Co., 53-55 Main St., Cincinnati, O. $27,280
Ed. J. Howard, Jeffersonville, Ind..... 28,670

DREDGING SAGINAW RIVER.

Abstract of proposals for dredging Saginaw river, Mich., received in response to advertisement dated Dec. 16, 1907, and opened Jan. 16, 1908:

Name and address of bidder.	159,900 cu. yds. Section A. scow measure.	408,200 cu. yds. Section B. scow measure.	123,000 cu. yds. Section A. bank measure.	314,000 cu. yds. Section B. bank measure.
Central Dredging Co., Cleveland, O.	16½c	22½c		
The Toledo Dredging Co., Toledo, O.	24c	23c	31c	28c
James Rooney, Toledo, O.	20c			
Great Lakes Dredge & Dock Co., Chicago, Ill.	38c			

LOCKS IN TOMBIGBEE RIVER.

Contract for building locks Nos. 2 and 3 in Tombigbee river, Ala., have been awarded by Maj. H. Jervey, government engineer, to P. H. O'Brien, Anniston, Ala., upon his bid of $740,001.25. The other bid received was from Lane Bros. Co., Lynchburg, Va., at $842,610.

RULING ON DREDGES.

The war department has just made a ruling that no dredge will be constructed from appropriations for river and harbor improvements unless the legislation authorizing such improvements specifically directs that the dredge be constructed. This ruling of the department was made upon an application for a dredge to serve the western shore of Lake Michigan. During the past three or four years dredges have been built and operated by the engineers of the war department. There has always been opposition to the practice as a direct infringement upon private enterprise. There are many dredging concerns on the lakes both willing and competent to do the work quite as cheaply as the government can do it.

CALENDARS.

The Falls Hollow Staybolt Co., Cuyahoga Falls, has just issued a calendar which, in a pictorial sense, is the best we have seen so far this year. Franz Charlet's painting, "The First Days of Spring" is well reprinted on the three color process. The painting is that of three little boys in quaint Dutch costume spinning tops on the wharf.

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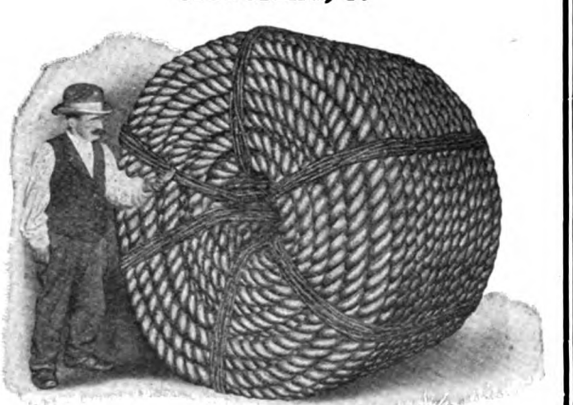

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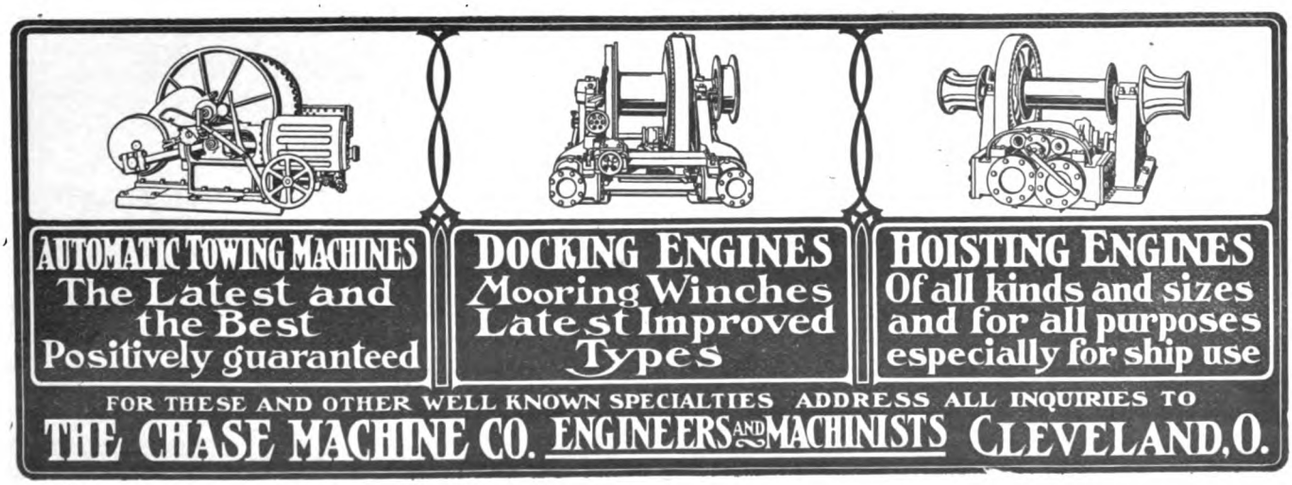
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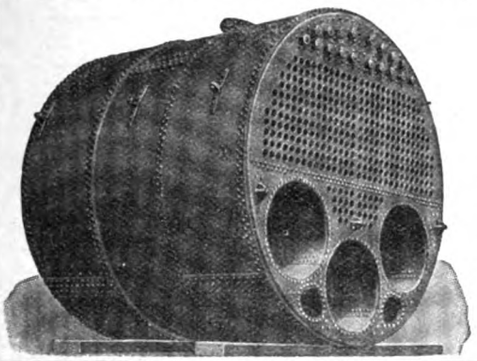

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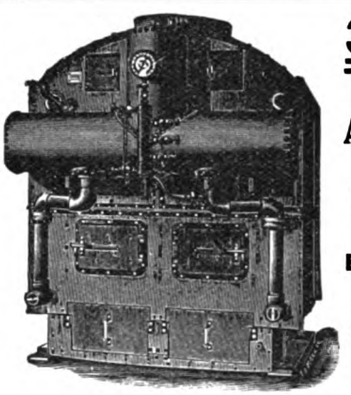

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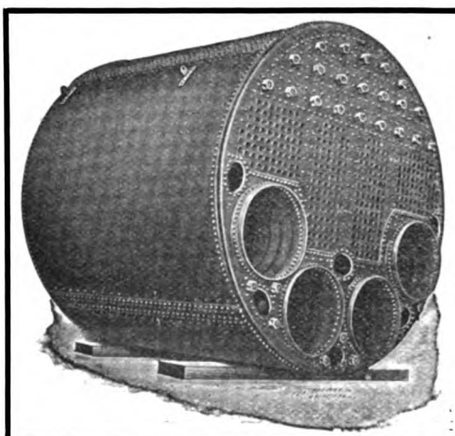

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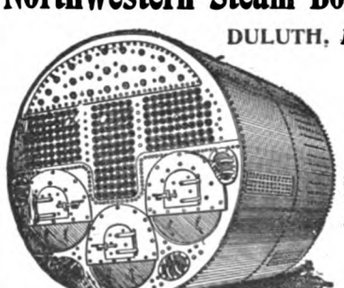

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PROPOSALS.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich. January 6, 1908. Sealed proposals for Construction of Sheet Pile Revetment at Muskegon Harbor, Mich., will be received here until 3 P. M., February 5, 1908, and then publicly opened. Information furnished on application. Charles Keller, Major, Engrs.

U. S. Engineer Office, Vandiver Building, Montgomery, Ala., January 2nd, 1908. Sealed proposals for constructing one creosoted wooden hull will be received at this office until 12 noon, February 1, 1908, and then publicly opened. Information furnished on application. H. B. Ferguson, Capt. Engrs.

U. S. Engineer Office, Buffalo, N. Y. Jan. 14, 1908. Sealed proposals for the construction of concrete walls for Ship Lock, Black Rock Harbor, at Buffalo, N. Y. will be received at this office until 11 o'clock a. m., March 14, 1908, and then publicly opened. Information furnished on application. H. M. Adams, Col. Engrs.

U. S. Engineer Office, 815 Witherspoon Building, Philadelphia, January 15, 1908. Sealed proposals for constructing one steel, twin-screw suction dredge for Galveston Harbor, Tex., will be received here until 2:30 P. M., February 14, 1908, and then publicly opened. Information furnished on application. J. C. Sanford, Major, Engrs.

PROPOSALS.—Sale of U. S. vessels *Pinta* and *Canonicus*.—Sealed proposals will be received at the Navy Department until noon on the 19th day of February, 1908, at which time and place they will be opened, for the purchase of the U. S. vessels *Pinta* and *Canonicus*, appraised values, $1,400 and $6,000, respectively. They will be sold for cash to the person or persons or to the corporation or corporations offering the highest price therefor. A separate proposal for each vessel bid upon must be submitted in a sealed envelope addressed to the Secretary of the Navy, Washington, D. C., endorsed "Proposals for the purchase of the U. S. S.——" (naming the vessel for which offer is made), and each proposal must be accompanied by a satisfactory certified check for not less than 10 per cent of the amount of the offer. On application to the Navy Department, forms of bids and bonds, together with the terms and conditions of sale, also a printed list giving general information concerning these vessels, will be furnished. The vessels can be examined at any time after this date by applying to the Commandants of the navy yards, Mare Island, Cal., and Norfolk, Va., respectively, where they now lie. They must be removed from the limits of said yards within such reasonable time as may be fixed by the department. The Department reserves the right to withdraw either or both of the above-named vessels from sale and to reject any or all bids. TRUMAN H. NEWBERRY, *Assistant Secretary of the Navy*. January 11, 1908.

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Boston & Lockport Block Co..... ..... Boston, Mass.

CHARTS.
Penton Publishing Co.....Cleveland.

CLOCKS (Marine and Ship's Bell) AND CHRONOMETERS.
Howard Clock Company..... .....Boston, New York, Chicago.
Ritchie, E. S. & Sons..... .....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.
Hanna, M. A. & Co.....Cleveland.
Lorain Coal & Dock Co..... ..... Cleveland.
Pickands, Mather & Co...Cleveland.
Pittsburg Coal Co.....Cleveland.

COAL AND ORE HANDLING MACHINERY.
Brown-Hoisting Machinery Co..... .....Cleveland.

COMPASSES.
Ritchie, E. S. & Son..... .....Brookline, Mass.

COMPOUND—PIPE JOINT.
U. S. Graphite Co....Saginaw, Mich.

CONDENSERS.
Great Lakes Engineering Works... ..... Detroit.
Wheeler Condenser & Engineering Co. .....New York.

CONTRACTORS FOR PUBLIC WORKS.
Breymann Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Dunbar & Sullivan Dredging Co.... .....Buffalo.
Great Lakes Dredge & Dock Co.... ..... Chicago.
Starke Dredge & Dock Co., C. H... ..... Milwaukee.
Sullivan, M. .....Buffalo.

CORDAGE.
Baker & Co., H. H.....Buffalo.
Buffalo Ship Chandlery & Supply Co. .....Buffalo.
Columbian Rope Co...Auburn, N. Y.
Upson-Walton Co.....Cleveland.

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